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ABSTRACT

This volume is the first of 5 constituting the final research project report on the introduction, use, and impact of ThinkAbout, a series of 60 15-minute instructional television programs for fifth and sixth graders designed to strengthen reasoning skills and to review and to reinforce language arts, mathematics, and study skills. Background information provided in this volume includes the project's history, audiences, and purposes, and descriptions of the complete report and supporting materials. Study procedures described include the research design, data collection instruments, project schedule, data management procedures, and research limitations. Data from program user and nonuser classrooms in Iowa, Mississippi, Oregon, and Pennsylvania that are reported are based on (1) the administration of seven tests from the Comprehensive Test of Basic Skills achievement battery, which included an instrument to measure attitudes toward problem-solving, problem-solving exercises, measures of self-management of the learning process, and measures of effective expressions; (2) responses from a context questionnaire administered to user and nonuser teachers; and (3) an end-of-the-year questionnaire administered to user teachers. Findings of four national surveys of user teachers are also presented. Discussion and interpretations of the data conclude this report. Thirty-one references are listed. (LMM)

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Volume I

Research on the Introduction, Use, and Impact of the **ThinkAbout** Instructional Television Series

Technical Report

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RESEARCH ON THE INTRODUCTION, USE, AND IMPACT OF THE THINKABOUT INSTRUCTIONAL TELEVISION SERIES

Volume I

TECHNICAL REPORT

James R. Sanders and Subhash R. Sonnad
Evaluation Center
Western Michigan University

January 1982

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This research was conducted for the Agency for Instructional Television, Box A, Bloomington, IN 47402. Financial support for the research was provided by the Corporation for Public Broadcasting, the Exxon Education Foundation, and the ThinkAbout consortium of state and provincial education agencies. Their support should not be construed as an endorsement of the research findings.

IR 011393

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J. R. S.
S. R. S.
January 1982

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*Appendices are contained in Vol. V.

I. INTRODUCTION

This document is Volume I of the final technical report for a research project commissioned by the Agency for Instructional Television on the introduction, use, and impact of the ThinkAbout instructional television series. The project was sponsored with funds from the Exxon Educational Foundation, the Corporation for Public Broadcasting, and the consortium that developed the series.*

This volume is organized in five sections. The present section contains background information about the research project, including its history, audiences, and purpose. The introduction ends with a description of the ThinkAbout series and supporting materials.

The second section of this volume provides a description of the procedures used in the study. Included in this section are the research design, details about the instruments used for data collection, the project schedule, a description of data management and quality control procedures, and a discussion of limitations of the research. The limitations discussion is especially important, since it stresses significant qualifications that must be placed on the data when conclusions are being drawn.

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*The financial support of Exxon and the Corporation for Public Broadcasting does not imply an endorsement by either organization of the research findings.

The third section of this volume contains the findings of the sub-study--the testing research. Results for all test instruments administered to classrooms in September/October, January/February, and April/May are presented. The testing was done in ThinkAbout user and nonuser classrooms in Iowa, Mississippi, Oregon, and Pennsylvania, using seven tests from the Comprehensive Test of Basic Skills (CTBS) achievement battery. The CTBS tests were supplemented with objectives-referenced tests developed by Dr. Martin Covington specifically for the ThinkAbout series. These tests included an instrument to measure attitudes toward problem solving, problem-solving exercises, measures of self-management of the learning process, and measures of effective expression. Responses from a context questionnaire administered to user and nonuser teachers in September/October and an end-of-year questionnaire administered to user teachers in April/May are also provided in this section.

The fourth section of this volume provides findings from four national surveys of user teachers. A student survey supplements the fourth teacher survey.

The final section contains conclusions and interpretations of the data reported in the third and fourth sections and Volumes II through IV. The data have been assimilated into the authors' view of instructional television, which has been shaped in part by a growing body of relevant literature and in part by the authors' own unique experiences. This section contains the authors' answers to the major questions which guided the study. It concludes with a discussion of implications of this research for future research in school television.

In the appendices (Vol. V), an attempt has been made to provide a compilation of the supporting information referred to in the report. Here the authors have purposely risked erring toward over-inclusiveness.

Three companion volumes (Vols. II-IV) contain in-depth case study reports by three field researchers who spent a considerable amount of time during the 1979-80 school year in ThinkAbout user classrooms, talking with many people about ThinkAbout. These reports are the unedited descriptions of what the researchers found, along with their interpretations and comments.

Every reader should read the case studies thoroughly because the authors, in presenting their interpretations and implications, cannot include all the rich information and insights that are embedded in these findings. The last section of this volume is a subjective and idiosyncratic selection. Others will undoubtedly find different gems worthy of attention.

The research project is reported in a total of five volumes:

Vol. I: Technical Report

Vol. II: ThinkAbout: Teacher Use and Student Response in Three Classrooms, by Marilyn R. Cohn

Vol. III: Toward a Clear Picture of ThinkAbout: An Account of Classroom Use, by Sylvia Hart-Landsberg

Vol. IV: A View of Viewers: Observations on the Response to and Classroom Use of ThinkAbout, a Program Produced by the Agency for Instructional Television, by Harry F. Wolcott

Vol. V: Appendices to Technical Report.

Background

The history of the research project actually began well before the formal design phase was initiated in April 1979. The project director (Sanders) was a consultant to the Agency for Instructional Television (AIT) on formative evaluation for the ThinkAbout project, beginning in December 1976. Early discussions of formative evaluation centered on developing and evaluating the conceptual framework, the rationale, and the goals and objectives for ThinkAbout. Questions regarding characteristics of the target audience, and attributes that might be included in the television programs, were also addressed in those early days.

One year later, Sanders was again called upon to advise on the formative evaluation of the series during its development. Discussions this time were on the interface between instructional design staff and evaluation staff at AIT. In particular these conversations focussed on the assignment of instructional development tasks. Since evaluation and development were closely aligned, it was often difficult to separate the planning and development responsibilities of the design staff from those of the evaluation staff.

From these discussions came a sense of the criteria and procedures one could use in systematically evaluating a new series, from early concept papers to finished programs. It was our feeling that systematic formative evaluation would anticipate the findings of outside summative evaluation. If formative evaluation was done well, we believed, there should be no surprises when summative evaluation findings were made available.

In the spring of 1978, the director of research at AIT contacted

Sanders to discuss what a summative evaluation of ThinkAbout might look like. Initially no limit was put on the cost of the evaluation: "$800,000-$1 million would not be unreasonable." What came out of the discussion was a conception of summative evaluation that in the end did not match the objectives of AIT or of representatives from the consortium. The advice from Sanders was that a summative evaluation had to address independently the hard questions that AIT had already dealt with. If one had over $4 million to spend on K-12 instructional materials, how would it best be spent? What K-12 curriculum needs should be awarded highest priority? What alternatives to television are there for achieving similar objectives? Why this particular target audience? What effect on student performance should be expected, and what effect does the series have? What long-term benefits result from the effort? What are the cost benefits compared to those of critical competitors? Could states and provinces use their money more wisely? Furthermore, a summative evaluation should be conducted by an independent agency, should address consumer (teacher, student, parent, taxpaper) concerns, and should be funded by a disinterested party.

This advice led to discussions about the type of inquiry that would be of most value to AIT and the consortium, and about policies for the inquiry which would be both prudent and feasible. The conclusion reached was that any study of ThinkAbout funded by AIT and the consortium had to be sensitive to the questions that they most needed to have answered.

Although the questions were not clearly defined at that point, a process for delineating them was developed. The process involved

AIT's using several outside R & D, university, and government agencies as sounding boards to identify reasonable questions to ask, using its own staff to identify questions for which it needed answers, and using the consortium members and other constituents to voice their information needs. A list of questions was to be developed and ranked according to their frequency and importance to AIT.

Meetings were held in 1978 and early 1979 to listen to the questions being raised. At the same time, a realistic budget for the study of ThinkAbout was developed, and a time schedule for the study was set. By February 1979 a set of questions and policies for the study were formed. The questions grew out of uncertainty: certain knowledge and information was deemed critical and it simply did not exist. The policies grew out of a need to control the study so that the effort would have a high probability of yielding the information sought and reducing the uncertainties.

Implicit in conceptualizing the study was the decision to make it not a summative evaluation study but an effort to reduce uncertainties and to generate useful descriptive information. Summative evaluation was seen as impractical and not serving AIT and the ThinkAbout consortium. Applied research which addressed certain well-conceived questions was seen as far more desirable. Thus, the current study was designed as applied research rather than evaluation, and this distinction greatly affected the policies which guided the project.

Purposes of the Study

There are certain elements which help define the purposes of a large research effort such as this. These elements include the research questions and their respective rationales, the audiences to whom the report of findings will be addressed, the ways they intend to use the findings, and policies which put boundaries on the research. The research questions selected to guide the study of ThinkAbout during the 1979-80 school year fall into two categories:

1. Introduction and use research—How is ThinkAbout used during its first year of availability? How was the decision to adopt the ThinkAbout curriculum made? What can be learned about how television is used in the classroom to aid in the design and production of future series? What are barriers to or facilitators of the effective use of instructional television in schools? Data on classroom introduction and use were gathered using surveys, observations, and interviews.

2. Impact research—What are the perceived and measurable effects of the series? How much student change can be noted with respect to the goals of the series? Is there a relationship between use patterns and impact? Do certain kinds of teachers and students find the series more useful than others? Impact research questions were explored through the use of tests, observations, interviews, and surveys.

There were other important questions raised during the meetings of 1978 and early 1979, but not all of them could be addressed in the study. The selection was determined by several policy considerations, which included the following:

1. Input from the audiences for the study—Those questions which were most frequently voiced and stressed were the ones that

received the highest priority.

2. Availability of research funds--The amount available to support the research effort was limited; thus, the number of questions had to be limited.

3. Credibility of data to be collected--The concerns of states and provinces, and their legislatures, for accountability data had to be addressed, and it was clearly stated that the only acceptable accountability data would be hard student test data. Furthermore, the data had to be collected from a wide geographical area in order to be believable to public audiences. This requirement was of course constrained by the amount of research funds available.

4. Timeliness of research reports--The need of audiences for information on which to base future funding and production decisions meant limiting the research schedule to a one-year period--1979-80, the first year of use. This decision precluded questions about long-term use and effects, and also questions which would require significant preparation time (e.g., for developing new psychometric instrumentation).

5. Feasibility of collecting data required to answer questions--Certain questions had to be put aside because the extensiveness or obtrusiveness of the data collection effort would preclude cooperation from schools using ThinkAbout. For example, the relationships among individual differences, differences in teaching styles, and outcomes could not be studied. Further policy considerations influenced decisions about research methods. These policies are discussed in Section II, Research Design.

To summarize, then, the purpose of the study was determined to be the collection of data sufficient to:

1) describe the classroom utilization of ThinkAbout;
2) define and monitor effects of ThinkAbout on fifth and sixth grade student basic skills and problem-solving ability; and
3) identify principles that may be used to guide future instructional television production and utilization efforts.

The ThinkAbout Instructional Television Series

A number of documents were developed by AIT to describe the new series. Some (e.g., Instructional Design Report No. 6) were prepared early in production to guide the staff during the formative stages of the series. Others (e.g., "Something to ThinkAbout") were developed for public-relations purposes. Still others (e.g., "The ThinkAbout project history") were systematically developed research documents. In addition, the Preliminary teacher's guide and the Teacher's guide were prepared to introduce teachers to ThinkAbout and to guide them in its use. All of these publications are available from AIT.

ThinkAbout is a series of 60 15-minute color television programs produced for use in fifth and sixth grade classrooms. The goals of the series are to help students: 1) effectively express themselves, 2) manage their own learning, 3) reason systematically, and 4) think flexibly. These goals were selected so that viewers could acquire and use skills needed to be independent learners and problem solvers.

At the same time, the series is intended to provide review and reinforcement for viewers on selected mathematics, language arts, and study skills. A list of these basic skills is provided in Table 1.

Table 1

A List of Language Arts, Mathematics, and Study Skills for ThinkAbout

"ThinkAbout" cluster and tip programs offer opportunities for the review and reinforcement of mathematics, language arts, and study skills. The list below identifies these skills and cites the programs in which they occur. Skills that are treated prominently are identified by bold-face program numbers, while numbers in lighter italic type indicate skills that are treated in a less prominent way.

LANGUAGE ARTS SKILLS	PROGRAM NUMBERS
Reading	
• Adjusting the rate of reading to suit one's purpose and the type of material being read.	**36**
• Comparing and contrasting ideas in a selection with one's own ideas.	**12**
• Identifying ambiguous statements.	**9**
• Identifying an author's assumptions.	**9, 14**
• Stating the main idea of a selected work.	*12, 41*
• Summarizing the meaning of a selection.	*12, 21,* **41**
• Using context clues to clarify the meaning of a selection.	**5, 13**
• Using headlines and the first paragraph of news articles to get the main idea.	*12*
Writing	
• Arranging paragraphs in a sequence.	**51**
• Perceiving the importance of legible handwriting.	**29**
• Preparing an outline as an aid to writing.	**21**
• Producing a written description, narrative, or poem about an event, experience, or feeling.	*3,* **12, 26**
• Supporting generalizations with specifics.	*41*
• Writing a communication that is designed to convince or persuade.	**20, 41, 51**
Listening	
• Demonstrating appropriate listening behavior.	**2, 35**
• Identifying the probable purpose of an oral communication.	**13**
• Paraphrasing or summarizing an oral communication.	**2**

Listening (Cont'd.)	PROGRAM NUMBERS
• Recognizing how emphasis, intonation, context, pauses, and nonverbal behavior add to the meaning of an oral communication.	**10,** *50*
• Understanding orally presented directions.	*32*
Speaking/Discussing/Presenting	
• Considering the effects of a presentation upon a particular audience.	**11,** *32,* **37, 51** **52, 53, 54**
• Demonstrating respect for one's audience.	*11, 30,* **52**
• Developing criteria for judging the appropriateness of a presentation for a specific purpose.	**30**
• Making a presentation interesting.	**52, 54**
• Making an audio-visual presentation.	**11,** *24,* **32**
• Making relevant comments while participating in a discussion.	**2,** *30*
• Organizing thoughts in a useful pattern when making a presentation.	*11,* **51**
• Rehearsing a presentation.	*50,* **52, 53**
• Using analogies and metaphors to explain complex ideas.	**4, 19, 21**
• Using appropriate nonverbal behavior to add to the meaning of a communication.	**25, 52**
• Using emphasis, intonation, and pauses to add meaning.	**10, 50, 52**
• Using style of communication appropriate to the audience.	**50**
• Using various art forms as alternative forms of communication.	**23, 54**
Viewing and Observing	
• Describing factually what was observed.	*12, 16, 17, 21* *24, 27,* **46**
• Describing how the audio and visual portions of a film contribute to its meaning.	**11,** *32*

(continued)

Table 1 (continued)

Viewing and Observing (Cont'd.)	PROGRAM NUMBERS
• Identifying clues that contribute to or detract from the total message of a visual communication	11, 33
• Identifying probable purpose of a visual communication.	48
MATHEMATICS SKILLS	
Graphs, Maps, and Scale Drawings	
• Choosing a graphing technique.	41
• Reading a line graph.	22, 24, 48
• Reading and making a bar graph.	18
• Reading and making a scale drawing.	3
• Reading maps using legends and scales	12, 42, 51 57, 58, 59
Measurement	
• Determining the level of accuracy of a measurement required for a particular purpose.	6
• Estimating time, distance, and rate of progress.	33, 58
• Finding measures of area and volume.	7
• Finding measures of length.	6, 16, 27
• Recognizing how perspectives affect estimations.	57
• Using an appropriate measuring device to obtain the approximate length.	6, 58
• Using estimations in making comparisons.	7
Computation	
• Finding the arithmetic average.	18

Computation (Cont'd.)	PROGRAM NUMBERS
• Interpreting mathematical symbols.	39
• Rounding numbers.	57
• Solving money problems.	56
• Translating simple problems into mathematical sentences for understanding and computations.	34, 40
STUDY SKILLS	
• Conducting a survey.	18
• Determining if the source is reliable.	44
• Locating print and nonprint reference material in a library or media center.	1, 17, 23
• Making predictions from data.	27
• Performing an experiment.	24, 27
• Planning and completing a task independently.	31, 43, 49
• Remembering required information.	4, 19
• Taking and using notes.	16, 17, 19, 21, 45, 46
• Using a problem-solving guide.	8, 23
• Using resource persons to obtain information.	17, 18, 21, 29 30, 44, 46, 47, 59
• Using standard reference aids:	
bilingual dictionary,	45
classified ads in a newspaper,	16
encyclopedia.	17
• Using test-taking strategies.	34
• Using the index and table of contents of a book to locate information.	1

(ThinkAbout Teacher's guide, 1979, pp. 86-87)

The ThinkAbout programs are organized in clusters, or groups of programs, aimed at certain problem-solving skills. In addition, there are Tip and Challenge programs interspersed between clusters. The eight Tip programs were designed to offer special ideas in independent learning and problem solving for students to discuss and practice. The five Challenge programs provide complex problems for student investigation when the program is over. A list of the clusters and Tip programs, along with the language arts, mathematics, and study skills they are to review and reinforce, is provided in Table 2.

An example of a Challenge program is Program 28, "Search for the Unknown." The program summary from the teacher's guide is as follows:

> PROGRAM SUMMARY
>
> A narrator summarizes the history of the Loch Ness phenomenon. Arguments for and against the existence of "Nessie," the supposed Loch Ness monster, are presented. The narrator describes attempts to identify Nessie as a known creature--a sea turtle, an eel, a squid, a shark. Efforts to photograph Nessie are recounted, and purported photographs and films of the monster are shown. Then the narrative considers application of modern technology to the search, including the use of infrared equipment, minisubs, autogyros, sonar, special cameras, and strobe lights.
>
> The program presents calculations of what the Loch Ness monster must weigh and how many such creatures could exist in the lake, given available food supplies. Other hypotheses are considered--that Nessie is a sea cow, a giant worm, a prehistoric plesiosaur, or that the monster doesn't exist at all.
>
> After a summary of the Loch Ness debate, students are challenged to come up with their own thoughtful explanations for this or another of the world's tantalizing mysteries--Big Foot or the Bermuda Triangle, for example.
>
> (ThinkAbout Teacher's guide, 1979, p. 39)

Table 2

Subject Skills

		Sets of Language Arts, Mathematics, and Study Skills								
CLUSTERS		READING	WRITING	LISTENING	SPEAKING/DISCUSSING/ PRESENTING	VIEWING AND OBSERVING	GRAPHS, MAPS, AND SCALE DRAWINGS	MEASUREMENT	COMPUTATION	STUDY SKILLS
1. Finding Alternatives	(Programs 1-3)		■	▬	▬		▬			▬
2. Estimating & Approximating	(Programs 5-7)	▬						▬		
3. Giving & Getting Meaning	(Programs 9-14)	▬	▬	▬	▬	▬	▬			
4. Collecting Information	(Programs 16-18)					■	▬	■	▬	▬
5. Classifying	(Programs 20-22)	▬	▬		▬	■	▬			▬
6. Finding Patterns	(Programs 24-27)		▬		▬	■	▬	■		▬
7. Generalizing	(Programs 29 & 30)		▬		■					▬
8. Sequencing & Scheduling	(Programs 32 & 33)			■	▬	■		▬		
9. Using Criteria	(Programs 35 & 37)	▬		▬	▬					
10. Reshaping Information	(Programs 39-42)	▬	▬				▬		▬	
11. Judging Information	(Programs 44-48)					▬	▬			▬
12. Communicating Effectively	(Programs 50-54)		▬	■	▬		▬			
13. Solving Problems	(Programs 56-59)						▬	▬	▬	▬
TIPS										
1. You Can Remember!	(Program 4)				▬					▬
2. Find Your Guide	(Program 8)									▬
3. Ways to Remember	(Program 19)				▬					▬
4. There Are Many Ways to Go	(Program 23)				▬					▬
5. Practice for Success	(Program 31)									▬
6. Calm Your Jitters	(Program 34)								■	▬
7. Get Ahead With Goals	(Program 43)									▬
8. Make a Deal With Yourself	(Program 49)									▬

▬ Explicit use.
■ Implied in a problem-solving situation.

(ThinkAbout Teacher's guide, 1979, p. 88)

Accompanying the 60 15-minute programs is a 95-page teacher's guide. In the guide there is a list of cluster goals with a brief rationale for each cluster. For each program within a cluster, for each Tip program, and for each Challenge program, the guide lists teaching points, discussion suggestions to introduce the program, a program summary, and discussion and follow-up suggestions to follow the program. There are also cluster activities suggested throughout each cluster section. An example of a cluster activity follows:

> WHAT HAPPENED TO THE DINOSAUR? (Science, Mathematics)
>
> Ever wonder what happened to the mighty dinosaurs? They existed for several million years and then vanished. Scientists remain baffled by their disappearance. Have students try their skill at explaining the riddle or at developing theories. Explore the problem in some of the following ways:
>
> > READ about dinosaurs, their habits, habitats, and needs. Find out what the earth was like during their time. Share the knowledge and materials with the class.
> >
> > MAKE A TIME LINE showing when dinosaurs existed. Use a scale to depict time in years. Illustrate the time line with drawings of plants and animals that existed at each point.
> >
> > BRAINSTORM theories for what happened to dinosaurs. Read about theories that scientists have proposed.
> >
> > PRESENT a panel of student experts or put on a student talk/interview show titled: "What Happened to the Dinosaur?"
>
> (ThinkAbout Teacher's guide, 1979, p. 9)

Finally, the teacher's guide provides related facts, lists, and definitions within the cluster sections. Two examples of such supplements are:

THE SCIENTIFIC METHOD

The scientific method is a thinking guide that is used as a way to draw conclusions in the area of science. It is an orderly way to think about and solve problems. It has been developed by many scientists over hundreds of years. Like all thinking guides, it is not necessarily followed in lock-step fashion but includes these five steps:

--Stating the problem.
--Forming the hypothesis.
--Observing and experimenting.
--Interpreting the data.
--Drawing conclusions.

Student scientists often use these five steps, whether they label them or not, as they perform science experiments.

(ThinkAbout Teacher's guide, 1979, p. 43)

There was a time when sexual and racial criteria were used to determine who could vote.

Two early American feminists, ELIZABETH CADY STANTON (1815-1902) and SUSAN B. ANTHONY (1820-1906), devoted their lives to changing these criteria. As a child Elizabeth Cady Stanton became aware, through her father's law practice, of laws that deprived married women of many basic rights, including the right to own property or make contracts. Susan B. Anthony, whose Quaker family was active in the anti-slavery movement, also learned at an early age how laws can be written to benefit some people and exclude others.

With the passage in the 1860's of the Fourteenth and Fifteenth Amendments to the U. S. Constitution, former slaves were given the right to vote; but the wording of the Fourteenth Amendment specifed that this right was being extended to include all *males*. Women were now implicitly denied the right to vote, by constitutional amendment. Clearly, the cause of equal rights for women still had a long way to go.

> Stanton, Anthony, and their fellow "suffragists"--so called after the legal term *suffrage*, meaning the right to vote--endured astonishing hardships. They were ridiculed in the press, abused and insulted in public, even threatened by mobs. In 1892 Anthony was arrested, tried, and convicted in Rochester, New York, for the "crime" of trying to vote. Neither woman lived to see the ratification in 1920 of the Nineteenth Amendment, which forbade the use of sex as a criterion for the right to vote. But their years of struggle helped pave the way for its passage.
>
> In Canada, NELLIE McCLUNG (1873-1951) had a similar influence on the elimination of sexist criteria from voting laws. A skillful writer, McClung used her gift for satire to point out the unfairness of such criteria. In 1914 she staged a mock parliament at a Winnipeg theatre, ridiculing the Manitoba Provincial Government's attitudes toward women. By reversing traditional male and female roles, she had audiences roaring in delighted self-recognition as men beseeched an all-female parliament for the right to vote.
>
> The show was a financial as well as a theatrical success, and did much to promote the cause of women's rights.
>
> (ThinkAbout Teacher's guide, 1979, p. 53)

During the 1979-80 school year, the Weekly Reader for fifth and sixth grade classes included a ThinkAbout feature in each issue. The teacher's editions of Weekly Reader also provided background information and suggestions for applying ThinkAbout skills to the study of current events. A sample feature from the December 5, 1979 Weekly Reader appeared as follows:

> THINKABOUT
>
> Wouldn't it be great if there were one certain way to solve problems? What a help that would be. But as you know, there isn't. There are as many ways to go about solving a problem as there are problems and people with problems.
>
> Some people *use research* to help them with some of their problems. Some people find that *talking to*

> *experts* helps them. Other people say that *observing experts* has given them the help they needed. Still others say that *following their instincts* has helped them to solve their problems.
>
> What about you? Have you had to solve a problem recently? What approaches did you take to solve it? Did they work?
>
> Conduct a survey among your classmates to see how they go about solving problems. Ask: *What was your problem? How did you solve it?*
>
> Share the results of the survey with your classmates. You may learn some remarkable, surefire ways to help you with some common problems you've been wrestling with for some time.
>
> Next ThinkAbout: Patterns and how they can help with problems.

Orientation materials for teachers, administrators, and the community were produced by AIT and disseminated through AIT consortium state and province departments of education. In addition, workshops and in-service introductions for ThinkAbout were provided primarily during the spring and fall of 1979 by representatives of AIT consortium states and provinces for teachers, school administrators, curriculum specialists, and media directors.

All of the above contributed to the ThinkAbout series, which was introduced in 1979 and 1980. The object of study in this research project was the introduction, use, and impact of the series.

II. RESEARCH METHODS

This section contains a description of the research design, subjects, instrumentation, project schedule, data management and quality control, and limitations of the project. Supporting information for this section is provided in the appendices (Vol. V).

Research Design

The purposes and research questions presented in the first section were the primary determiners of the research methods to be used in the project. However, there were other serious policy considerations which affected the selection of strategies:

--The numbers of individuals and sites that would be accessible and from which information could be collected within time and budget constraints

--Populations and settings of interest

--Quality control over instrumentation and data collection

--Standards for judging applied research

--Availability of instruments and a knowledge base to guide the research.

A number of research strategies were considered for their appropriateness in achieving the purposes of the study as well as attending to the considerations listed above. In April 1979 a decision was made to develop detailed designs for a set of three complementary approaches: first, a testing (outcome) study using a quasi-experimental design and using questionnaires to collect process information from classrooms being studied; second, a series of national mail surveys to known users of ThinkAbout; and third, a small number of intensive case studies of classrooms where ThinkAbout was being used.

During April through July 1979, the Evaluation Center at Western Michigan University, under contract to the Agency for Instructional Television, prepared the details of the designs for the three studies and began making arrangements for the fieldwork.

The Testing Study

The guiding objective of the testing study was to monitor two areas of student performance in user and nonuser classrooms during the 1979-80 school year. The first area was that of basic skills to be reinforced by ThinkAbout instruction. The second area was that of the ThinkAbout goals of problem solving, self-management, and effective communication.

A quasi-experimental, non-equivalent control group design was selected for the testing study since comparative (user-versus-nonuser) information would be needed to determine in what areas the ThinkAbout treatment was having an effect. Classrooms could use or not use the series as they wished; no one was required to use all (or any) of the programs. Because we wanted variations in the amount of use, teachers had to be allowed to select naturally whether they wanted to use ThinkAbout and also whether they wanted to participate in the study.

Four states--Iowa, Mississippi, Oregon, and Pennsylvania—were asked to participate in the study in order to provide geographical (and setting) spread. The four were selected because of their cooperation and support for the study. Invitations went to only four states because of the cost of involving more. Clusters of classrooms within the states were used because of the logistical need to limit contacts with state departments and other central testing coordinators.

Classrooms were selected at the fifth and sixth grade levels to complete the quasi-experimental design. There was considerable interest in differential results at the two grade levels for which ThinkAbout was targeted, especially in light of the planning that was already going on for follow-up series at the fourth and seventh grade levels.

The classroom was chosen as the unit for sampling and analysis in the testing study, since the treatment would be group-administered and there was good reason to believe that individual student performances within classrooms would be correlated.[1]

The resulting research design for the testing study had three dimensions--states (4), treatments (user-nonuser, 2), and grades (2)--and is depicted in Table 3.

Table 3

Research Design for the Testing Study

		Users	Nonusers
Iowa	5th	n = 18 classrooms	n = 18
	6th	n = 18	n = 18
Mississippi	5th	n = 18	n = 18
	6th	n = 18	n = 18
Oregon	5th	n = 18	n = 18
	6th	n = 18	n = 18
Pennsylvania	5th	n = 18	n = 18
	6th	n = 18	n = 18

---

[1] A growth in performance on any test from fall to spring testing of one-half standard deviation was deemed noteworthy, and the number of classrooms to be selected for each cell in the design was fixed at 18 after power calculations were completed.

Hence 72 classrooms were solicited within each of the four states, 36 using ThinkAbout and 36 not using ThinkAbout. Half of the users would be fifth grade classrooms and the other half sixth grade; half of the nonusers would be fifth grade and half sixth grade.

A decision was made to test with the same tests in the fall (pretest) and again in the spring (post-test) of the 1979-80 school year. Since AIT was also interested in analyzing midyear results, the participating classrooms were also asked to volunteer for a winter testing.

The Surveys

Four mail questionnaires were scheduled for the 1979-80 school year, each to be sent to approximately 1,000 classroom teachers using ThinkAbout. A student survey was also conducted at the time of the fourth teacher survey. In that survey each teacher recipient was asked to give questionnaires to two students in the class. The students then returned their completed questionnaires separately from the teacher's. The guiding objective for this part of the study was to collect descriptive information about teachers using ThinkAbout, the settings in which it was used, how it was used, reactions, and suggestions to aid in the development and utilization of future instructional television series.

Two steps were taken in the surveys to increase the rate of return. First, each questionnaire was kept as short as possible with structured response formats. Second, entertaining follow-up letters were sent to non-respondents.

The set of four surveys provided distinct advantages over a single survey. Conducting four surveys over seven months enabled the researchers to match different topics to the implementation and utilization phases of the ThinkAbout series. For example, the first survey emphasized the availability of television equipment, the use of ITV series, the adoption of the ThinkAbout series, and training available to teachers. The second survey emphasized viewing patterns and uses of ThinkAbout. The third survey collected information about teacher attitudes, opinions, and patterns of use. The fourth survey was oriented toward levels of use of ThinkAbout, the perceived impact of the series on students, and the reactions of teachers to the series. Some respondents were administered more than one questionnaire during the year.

For each of the four surveys, the number of questionnaires mailed, the number of useable returns, and the number of people who had previously received a questionnaire are recorded in Table 4.

Table 4

Number of Surveys

				Survey 4	
	Survey 1	Survey 2	Survey 3	Teachers	Students
Number mailed	1147	1078	1023	1006	1006
Number of useable returns	730	462	530	737	718
Number mailed to people who had previously received a questionnaire	0	220	322	712	0
Number of useable returns from people who had previously received a questionnaire	0	128	202	363	0

The surveys contributed valuable descriptive information about the series in classrooms where teachers were known to be using ThinkAbout and were willing to share their experiences. This group of respondents constituted the population for the study. This population is further described in Section IV.

The Case Studies

Three experienced field researchers were invited to examine the introduction, use, and impact of ThinkAbout in the classroom during the 1979-80 school year. The objective of this approach was to gain insights into and rich descriptions of classroom processes and contextual influences on each classroom experience. This information will be useful in developing future plans for instructional television series.

The most important decision in this part of the study was to select the case study researchers. Sites for the studies were selected only after commitments with the researchers were made. Because of the importance of training and previous experience, a search was made for individuals with qualifications in case study research. The project was fortunate to retain Drs. Marilyn Cohn, Sylvia Hart-Landsberg, and Harry Wolcott. Classrooms for study were obtained in the St. Louis, Missouri, Portland, Oregon, and Eugene, Oregon areas, corresponding to the home locations of the researchers.

An initial orientation meeting of the case study team was held prior to the beginning of the 1979-80 school year at Western Michigan University. This orientation included an overview of the ThinkAbout series, the research project, and the roles of the case study researchers. Discussions of issues that had been identified in earlier consortium meetings, by AIT staff, by Evaluation Center staff, and in the literature occupied a good part of this meeting. It was agreed that the researchers would each do at least one intensive study of a classroom (at least two months in duration) and would use their judgments about spreading the rest of their time over a number of classrooms or limiting it to one or two additional intensive studies. They would make arrangements for their classrooms and arrange their own schedules with the teachers and school administrators. As it turned out, Dr. Hart-Landsberg conducted one intensive case study, Dr. Wolcott conducted two, and Dr. Cohn conducted three. All three researchers also carried out a number of other interviews and observations.

A case study team meeting was held in Portland, Oregon in December to review progress and to share insights and questions. This meeting proved important in focussing the studies and in further identifying issues. A final meeting was held in St. Louis in March as the close of the school year approached.

During the entire year, monthly field reports were shared by the researchers. Correspondence from the Evaluation Center was also used to keep information and ideas flowing to and from the researchers. Copies of the orientation meeting agenda and the December meeting agenda may be found in Appendix A (Vol. V).

Subjects

The people who served as sources of information and as informants covered a wide range of roles, settings, and perspectives across the three studies that composed the project.

The Testing Study

The design of the testing study called for the participation of 72 intact classrooms from each of the four states that took part in the project. For several reasons, however, the actual number of classrooms at each of the three testing times varied from this number. The actual numbers of participating classrooms are given in Table 5.

Table 5

Number of Classrooms

	Fall Testing	Winter Testing	Spring Testing
Iowa	73	48	73
Mississippi	76	39	74
Oregon	45	38	44
Pennsylvania	47	29	46

A testing coordinator in each state was asked to get commitments from teachers in locations that would well represent the demography of the state. The actual geographical spread of participating classrooms in the four states may be seen in Figure 1. The teachers who were contacted were selected by the state coordinators, and the teachers who participated did so voluntarily. The state coordinators in Iowa and Mississippi were staff members of the state educational television authority which participated in the AIT consortium. In Oregon the coordinator was a staff member of the State Department of Education and a participant in the AIT consortium. In Pennsylvania there were two coordinators who were staff members of educational television stations in Hershey and State College.

The reasons why the number of classrooms deviated from the 72 originally sought were the difficulty in locating teachers willing to participate in testing (in Oregon and Pennsylvnia) and the limited number of teachers planning to use ThinkAbout during its first year of broadcast (in Oregon). The winter testing was made optional for teachers to maintain their cooperation in fall and spring testing, although a minimum of 36 classrooms, spread evenly across the design,

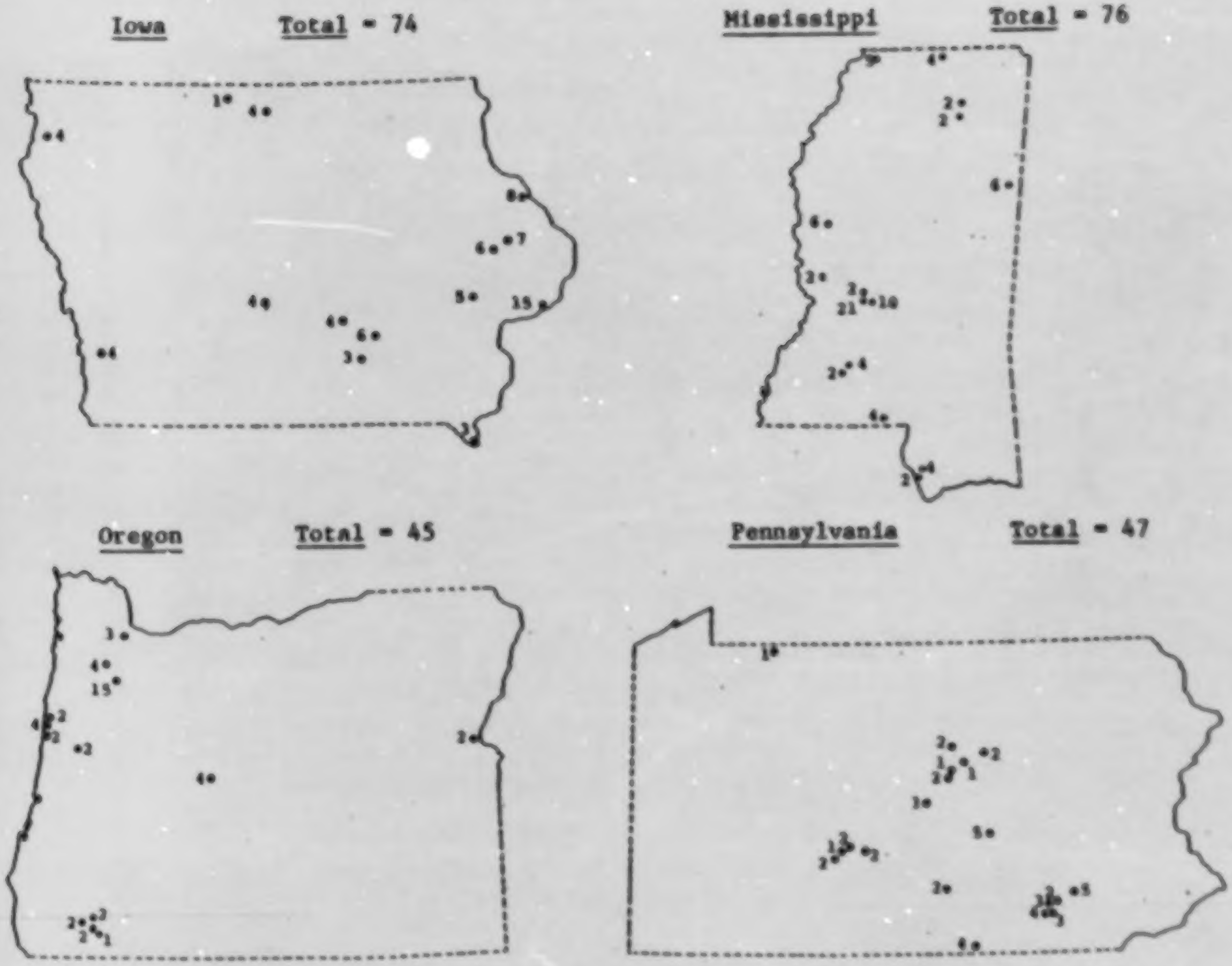

Iowa
Total = 74
Mississippi
Total = 76
Oregon
Total = 45
Pennsylvania
Total = 47

Figure 1. Testing study classrooms.

was requested. This fact accounts for the lower number of classrooms tested in winter. The resulting distribution of participating classrooms across the three testing times are reported in Table 6.

Table 6

Final Distribution of Classroom Testing Study

	Classrooms Using ThinkAbout				Classrooms Not Using ThinkAbout			
		Fall	Winter	Spring		Fall	Winter	Spring
Iowa	Grade 5	25	18	24	Grade 5	16	10	16
	Grade 6	17	14	17	Grade 6	15	6	16
Mississippi	Grade 5	18	9	18	Grade 5	19	10	18
	Grade 6	20	10	19	Grade 6	19	10	19
Oregon	Grade 5	14	12	14	Grade 5	12	11	11
	Grade 6	11	9	10	Grade 6	8	6	9
Pennsylvania	Grade 5	11	8	11	Grade 5	12	7	12
	Grade 6	11	5	11	Grade 6	13	9	12

A context questionnaire was given to participating teachers at the fall testing. Classroom demographic information was collected primarily to determine whether differences between user and nonuser classrooms could be detected in the study. This demographic information is summarized in Section III. It reveals no discernible differences in classroom characteristics between the two groups.

A questionnaire was given in the spring to teachers who used ThinkAbout, to ascertain their level of use.

The Surveys

No sampling frame existed at the beginning of the 1979-80 school year because teachers had not made decisions about using ThinkAbout and even when they had, their decisions were not known by any central agency. Thus a list of teachers using or possibly using ThinkAbout had to be developed during September and October 1979. With the aid of an extensive solicitation by AIT, names of classroom teachers and others throughout consortium states were obtained and placed into four categories for the surveys:

1) Known users--2,544 were identified for the surveys by the end of the school year.

2) Probable users--3,872 were identified by the end of the school year. This group came primarily from workshop lists, requests for ThinkAbout teacher's guides, or other evidence of interest in the series.

3) Contact people--1,231 had been contacted by the end of the year. These were people who were likely to know the names of ThinkAbout users, such as school building principals or school district media specialists.

4) Public television representatives--121 had been contacted by the end of the year. As in category 3, these people were asked for names of known users of ThinkAbout, which were then placed in category 1.

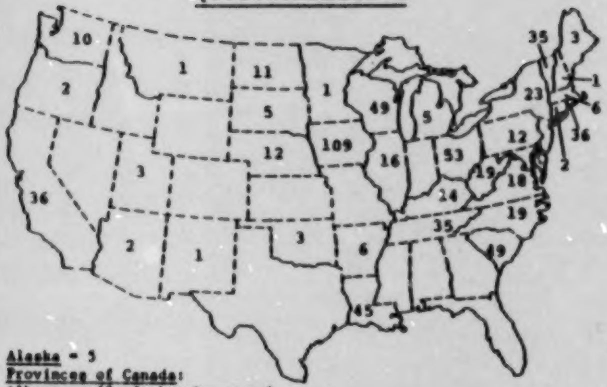
In all, slightly over 3,000 teachers were identified and placed in either category 1 or category 2 for the 1979-80 school year. These teachers constituted the population to whom questionnaires were sent. Descriptive information about the respondents in the four surveys is provided in Section IV. U.S. maps indicating the locations of respondents in surveys 1-4 are presented in Figure 2.

The Case Studies

The classrooms selected for study by the field researchers were found only by trial and error and after some searching. Before a commitment was made to spend a lot of time in a classroom, it was important to ensure that the learning experience would be productive. The team sought cases that would differ from one another in setting and use of ThinkAbout. The cases found included the following:

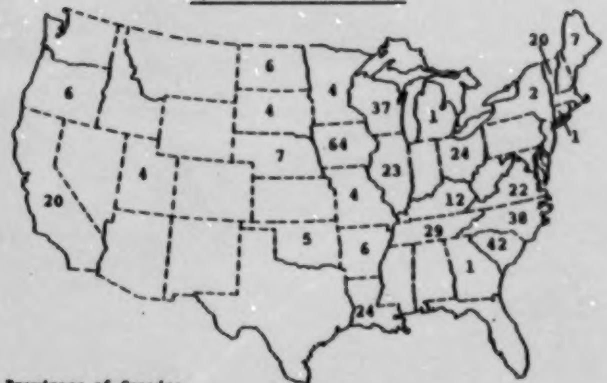
1) A fifth grade, midwestern suburban, self-contained classroom, white

Questionnaire 1


10
2
36
1
11
5
12
3
2
1
3
1
109
49
5
16
53
6
45
24
35
19
18
19
12
23
35
3
1
6
36
2
49

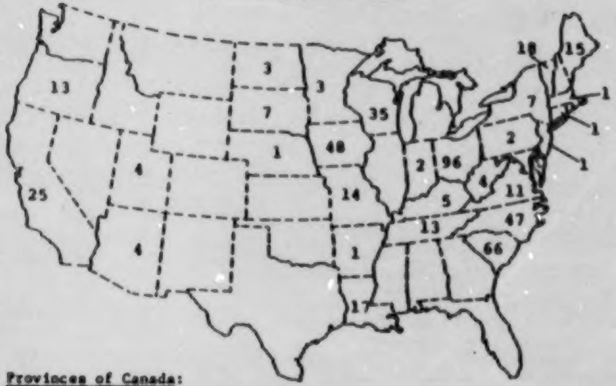
Alaska = 5
Provinces of Canada:
Alberta = 62, Saskatchewan = 6
States Not Indicated on Questionnaire = 2
Total = 729

Questionnaire 2


6
20
4
6
4
7
5
4
64
4
6
24
37
23
1
24
12
29
1
22
38
42
2
20
7
1

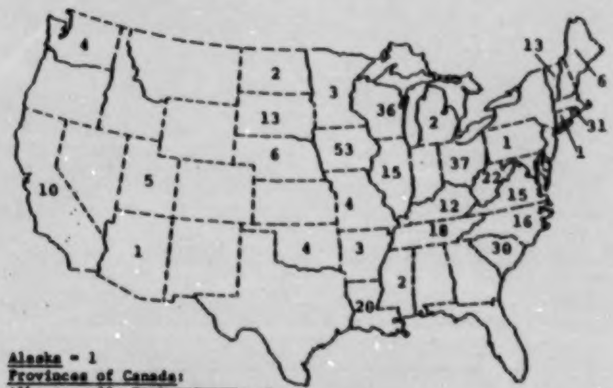
Provinces of Canada:
Saskatchewan = 12
Total = 452

Questionnaire 3


13
25
4
4
3
7
1
3
48
14
1
17
35
2
96
5
13
4
11
47
66
2
7
18
15
1
1
1
1

Provinces of Canada:
Saskatchewan = 2
States Not Indicated on Questionnaire = 3
Total = 486

Questionnaire 4


4
10
5
1
2
13
6
4
3
53
4
3
20
2
36
15
2
37
12
18
22
15
16
30
1
13
6
31
1

Alaska = 1
Provinces of Canada:
Alberta = 39, Saskatchewan = 9
States Not Indicated on Questionnaire = 3
Total = 467

Figure 2. Survey respondents using *ThinkAbout*.

2) A sixth grade, midwestern suburban, departmentalized (social studies classes), racially mixed

3) A fifth grade, midwestern suburban, departmentalized (library classes), racially mixed

4) A fifth grade, northwestern urban, self-contained classroom, white

5) A mixed fifth and sixth grade, gifted and talented class in a northwestern city, white

6) A sixth grade, northwestern small town, self-contained classroom, white.

Instrumentation

Numerous instruments were used across the three studies to collect information for the project. Some instruments were already available and known; others had to be developed specifically for the project. Although the time available for instrument development was severely limited (five years is a typical developmental period for a standardized achievement test), much was developed that will be refined for future research use.

The Testing Study

AIT had the foresight to contract with an independent test developer as early as possible. In January 1979, Dr. Martin Covington, a psychologist at the University of California-Berkeley, was asked to develop instruments to measure achievement of the particular goals of ThinkAbout. Those instruments and the time when each became available are as follows:

1) ThinkAbout problem solving exercises (available in September 1979)

    a. Maria's Vegetable Garden, Form B
    b. Maria's Vegetable Garden, Form C
    c. Brian's Doormats, Form B

   - d. Brian's Doormats, Form C
   - e. The Mystery of the Whales, Form B
   - f. The Mystery of the Whales, Form C

2) ThinkAbout self-management exercises (available in January 1980)

   - a. Jan's Report, Form A
   - b. Jan's Report, Form B
   - c. Jim's Spacecraft, Form A
   - d. Jim's Spacecraft, Form B

3) ThinkAbout effective communication exercises (available in January 1980)

   - a. The Deadly Drink, Form A
   - b. The Deadly Drink, Form B
   - c. The Deadly Refrigerator, Form A
   - d. The Deadly Refrigerator, Form B

4) The Attitude toward Problem Solving Inventory[2] (available in September 1979)

The different forms of the instruments contain different items and cannot be considered alternative or equivalent forms of the same test. However, forms with the same letter (e.g., Maria's, Form B; Brian's, Form B; Mystery, Form B) all contain the same questions about different problem situations. The instruments are all treated in this report as separate measures of student performance and attitude.

Technical information about these instruments is available from AIT; copies of the instruments provided in Appendix B. Because of the experimental nature of these instruments, results were analyzed item by item before aggregation.

Since ThinkAbout was intended to reinforce a number of basic skills in traditional school subject areas, a decision was made to search for skills on which the series' impact could be seen.

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[2] This instrument measures student attitudes using Likert-scaled item response formats, while the other instruments include items measuring student performance levels and items measuring attitudes and opinions.

Although the instructional designers for the series had listed skills toward which some program content was directed, there was no experience with the actual effects of ThinkAbout on fifth and sixth grade basic skills. Hence a search for effects was planned, using a known basic skills instrument that appeared to overlap the instructional content. This search for effects was like a radar scan covering a wide area of skills, looking for blips where performance was believed to be enhanced by ThinkAbout. To conduct the scan, a wide range of ground had to be covered, and the ground had to be an area likely to be affected by ThinkAbout. Beginning in April 1979, staff at the Evaluation Center began detailed analyses of over 50 available instruments in hopes of identifying a skills test that could be used to monitor student basic skills achievement levels. A list of the tests that were analyzed and a copy of the analysis form are provided in Appendix C. The procedures used in this analysis closely followed those used by Porter et al. (1978).

Of the 50 instruments, the Comprehensive Test of Basic Skills (CTBS) was found to most overlap the skills listed in the instructional design for the series. The following subtests of Level 2, Form S of the CTBS provided good coverage of the content areas listed in the curriculum design:

1. Test 2—reading comprehension (45 items)
2. Test 5—language expression (35 items)
3. Test 7A—mathematics concepts (25 items)
4. Test 7B—mathematics applications (25 items)
5. Test 8—reference skills (20 items)

6. Test 9—science (36 items)

7. Test 10—social studies (37 items).

Technical information about this test is provided by the publisher, and a review of the CTBS may be found in Buros' 7th Mental Measurements Yearbook (1972).

Teachers who were participating in the testing study were asked to complete questionnaires during the fall and spring testing periods. In the fall, both users and nonusers of ThinkAbout completed a classroom context questionnaire to provide information about the classrooms taking part in the study. In the spring, teachers who were using ThinkAbout completed a questionnaire about their level of use of the series and about the way it was used.

In addition, examiners who administered the tests in the fall, winter, and spring completed cards about the examination process. Copies of the classroom context questionnaire, end-of-year questionnaire (given to ThinkAbout users only), and the examiners' questionnaire are provided in Appendix D.

The Surveys

All survey questionnaires were developed by Evaluation Center staff. Each questionnaire was developed through interaction with AIT staff, consortium members, and classroom teachers. Instrument development always began with a list of issues gleaned from consortium meeting notes, discussions with AIT staff, suggestions from the case study researchers, and literature reviews. These issues were reviewed by AIT and Evaluation Center staff to set priorities for information gathering and to assign issues to the most appropriate survey time to address them.

A limit of two pages of questions was put on the questionnaires to increase the probability of getting returns. Furthermore, questions were structured so that most items could be answered with a simple checkoff. For each issue to be addressed, questions were drafted on a questionnaire and ordered in a logical format. Directions were then added. The draft instrument was pilot-tested with accessible teachers and then revised. Humorous follow-up letters to non-respondents were used for each survey. Copies of the survey instruments, cover letters, and follow-up letters may be found in Appendix E.

The Case Studies

Although no formal tests or instruments were used in the case studies, the case study researchers themselves may be seen as instruments. It is thus very important to consider the backgrounds and previous experiences of these researchers in considering their reports. Each report provides information about the researcher's perspective.

Schedule

In a project as complex as this, it is important to see the flow of research procedures in a chronological display. What follows is an annotated description of the project as it unfolded. This description begins in April 1979 with project design and test analysis activities and continues through June 1981 with the completion of this report.

April 1979	A four-month contract with AIT to develop the research design and management plan, and to conduct test analyses for the testing study, was signed by the Evaluation Center. Evaluation Center staff were assigned for this first phase of the project. Relevant documents were collected from AIT and read.

	Test analysis forms were developed. The search for tests and the acquisition of relevant instruments for analysis was begun.
May 1979	Consultants were brought in to advise on the design of the project. These consultants included Dr. David RindsKopf (now at New York University) on the testing study, Dr. Mary Lee Smith (University of Colorado) on the case studies, Drs. Brad Huitema and Michael Stoline (Western Michigan University) on the testing study, Dr. Subhash Sonnad (Western Michigan University) on the survey study, and Drs. Mary Anne Bunda and Paul Berge (Evaluation Center, Western Michigan University) on the testing study. Several alternative designs were drafted and evaluated. Test acquisition and analysis continued.
June 1979	Test analyses were completed, and a decision was made in consultation with AIT staff to go with the CTBS. Discussions of designs were conducted with AIT staff.
July 1979	Final details on the project design were completed and reported to AIT. Approval was given to the project plan, and a 14-month contract with AIT to implement the plan was signed by the Evaluation Center.
August 1979	Preparation of an examiner's manual for the testing study was undertaken by the Evaluation Center. Testing states were contacted, and agreements were completed. In consultation with the testing state coordinators, a workable testing schedule was devised so that classrooms could be split in half to administer all tests within a one-day testing period. The details of the testing procedure may be found in the ThinkAbout examiner's manual (Appendix F). A search for case study researchers was begun and completed. Commitments for the case studies were made for the 1979-80 school year. Evaluation Center staff assignments for the project were completed.
September 1979	First ThinkAbout testing instruments were received from the developer. Graphics and printing of these tests were completed by the Evaluation Center. CTBS test orders were received, and testing packets were prepared for each participating classroom. Site visits to each of the four testing states were made by Evaluation

Center staff. Orientation sessions were held, at which testing materials were delivered. A copy of the testing orientation session agenda and the list of materials delivered may be found in Appendix G. State coordinators obtained agreements from teachers and school administrators to participate in the testing study. Fall testing was begun.

The search for teachers to be included on the survey mailing list was begun by AIT staff. An initial list of issues to be addressed by the surveys was prepared by Evaluation Center staff. Survey procedures were refined.

The case study orientation meeting was conducted, and initial contacts with potential sites were made by the case study researchers.

October 1979

Fall testing was completed, and completed testing materials were received by the Evaluation Center. CTBS tests were shipped for scoring, and code books for hand scoring of the ThinkAbout tests were developed.

The first survey questionnaire was developed, pilot-tested, and revised. An initial mailing list for the surveys was received, and a second search for names was begun.

Formal agreements were completed with the case study researchers, and first field reports were received.

November 1979

Code books were completed for the original set of ThinkAbout tests. Minor printing revisions were completed, and a second printing for winter and spring testing was ordered. Coders were recruited for the ThinkAbout tests, and training sessions were conducted.

The first survey mail-out was sent and follow-up letters prepared. Returns were monitored for follow-up purposes.

Case study field reports were received. Arrangements for the December team meeting were begun.

December 1979

CTBS tapes and class record reports were received and checked. Class record reports to classroom teachers with interpretation guides were prepared for January mailing. The final set of ThinkAbout tests was received and graphics and printing work completed by the Evaluation Center. Testing packets for winter testing were prepared for January mailing. Coding of ThinkAbout tests (fall testing) was begun.

The first survey and follow-ups were completed, and a code book for the data was developed. Coding was begun on the first survey data. Draft questions for the second survey were prepared and reviewed.

The December meeting of the case study team was held in Portland, Oregon. Field reports were submitted, and the case studies continued.

January 1980

Fall testing results for the CTBS were mailed to all participating teachers. Packets for winter testing were shipped to examiners. Winter testing began. Coding of fall ThinkAbout tests continued. Code books for the new ThinkAbout tests were developed

The second survey mail-out was done. A report of first survey findings was submitted to AIT.

An interim report of what the case study researchers were reporting was prepared for AIT. The case studies continued.

February 1980

Winter testing continued, and most completed test packets were received by the Evaluation Center. Some follow-ups with testing classrooms were made. Coding of the fall ThinkAbout tests continued. Test computer runs were made on first CTBS data tape; errors were found and corrected.

Follow-ups for the second survey were completed. A code book for the second survey was developed, and coding was begun.

Field reports were received from the case study researchers, and the case studies continued.

March 1980

Winter CTBS test packets were shipped to CTB/McGraw-Hill for scoring. Dates were set for the spring testing period, and testing packets were prepared and shipped to examiners. Coding continued on fall ThinkAbout tests. Code books were prepared for the new ThinkAbout test, and coder training sessions were conducted.

The third survey questionnaire was developed, pilot-tested, revised, and mailed.

	Case study field reports were received, and the case studies continued. A case study team meeting was held in St. Louis to discuss final adjustments in the case studies and final reports.
April 1980	Winter CTBS test computer tape and class record forms were received. Class record forms and interpretation guides were sent to participating classroom teachers. Test runs were made on the computer tape, and errors found and corrected. Spring testing was begun. Coding of ThinkAbout tests continued. Follow-ups for the third survey questionnaire were completed. The fourth survey questionnaire for teachers and the student survey questionnaire were developed, pilot-tested, revised, and mailed. The case studies continued. Correspondence addressing the final reports and end-of-year issues was completed.
May 1980	Spring testing was completed, and most testing packets were received. Follow-ups on missing testing packets were carried out. Coding of the ThinkAbout tests continued. Thank-you letters were sent to all participants in the testing study. Follow-ups for the fourth survey questionnaire were completed. Code books for the second, third, and fourth surveys were completed, and training sessions for coders were conducted. Fieldwork for the case studies was completed; writing and analysis was begun.
June 1980	Spring CTBS testing packets were shipped to CTB/McGraw-Hill for scoring. Coding on the ThinkAbout tests continued. Writing and analyses by the case study researchers continued. Library work was undertaken to prepare for final reporting.
July 1980	The computer tape and class record forms were received for the spring CTBS tests. Test runs were made on the tape, errors found, and corrections made. Computer center personnel began work on matching and merging CTBS tapes to create the CTBS data file. Coding on the ThinkAbout tests from winter and spring continued.

	Coding of questionnaire data from the second, third, and fourth surveys was begun. Two case study reports were received, reviewed, and accepted. Library work continued.
August 1980	Computer data file development was completed, coding and quality control checks of ThinkAbout were completed, and data analyses of the testing data were begun. Coding and quality control checks for all survey data were completed, and data analyses for the survey data were begun. The final case study report was received, reviewed, and accepted. Analyses of case study findings were begun. Library readings were continued. Final technical report writing began.
September 1980	Data analysis printouts on testing data were checked, errors found and corrected. Data analyses were completed for the testing data. Data analysis printouts on survey data were checked, errors found, and corrections made. Data analyses were completed for the survey data.
June 1981	The first draft of the final technical report was prepared, and reviews were initiated.

Data Management and Quality Control

The logistics of the research were often rather complex. Data for the testing study were collected from four states through the help of various coordinators, educators, and administrators in each of the states. As 240 classrooms across four states and three sets of tests over eight months were scheduled, data collection posed interesting problems.

In the total project there were basically three sets of data to be coded, processed, and analyzed at the Evaluation Center (no coding and analysis were involved in the case studies): 1) CTBS tests, testing study data; 2) ThinkAbout tests, testing study data; and 3) questionnaires, survey data.

CTBS data were processed at McGraw-Hill. The only coding of the CTBS forms (except for 19 packages which came late and were hand-processed) was the coding of background information for each student on his or her form. The codes were later used to match and merge data on the three sets of test results.

ThinkAbout test data, on the other hand, involved extensive coding and processing. ThinkAbout test data consisted of the four parts shown in Table 7.

Table 7

ThinkAbout Test Data

		Tests		
Type of Data		1 Oct.	2 Jan.	3 Mar.
1. Attitudes toward Problem Solving		X	X	X
2. Problem-solving exercises		X	X	X
a) Maria's Vegetable Garden	Forms B and C			
b) Brian's Doormats	Forms B and C			
c) Mystery of the Whales	Forms B and C			
3. Self-management			X	X
a) Jan's Report	Forms A and B			
b) Jim's Spacecraft	Forms A and B			
4. Effective communication			X	X
a) Deadly Drink	Forms A and B			
b) Deadly Refrigerator	Forms A and B			

Fifteen different forms had to be coded. Only one instrument (Attitudes toward Problem Solving) consisted of forced-choice or fixed-alternative responses. All the other instruments consisted of a combination of open-ended responses and forced-choice or fixed-alternative responses. Though all 14 problem-solving exercises had separate code books it was necessary to maintain a consistent rationale among the code books for Forms A, B, and C. Great care was taken to construct these, and they were revised quite a few times before the final version was completed. The author of the instruments was contacted many times to clarify the purpose of his questions and the underlying rationale of the forms. After a tentative code book was constructed, half a dozen coders coded the exercises separately. Conferences were frequently held in which all the disagreements and discrepancies in coding were resolved. Changes were incorporated in the next draft. The final code books were constructed after at least three prior versions.

Stringent checking was done on all of the ThinkAbout data. The first set of coding by each coder was checked and verified, and if there were no errors, one of every three subsequent sets was checked. The coding of forced-choice responses was less stringent because there were very few errors. One out of five sets for the second test and one out of nine sets for the third test were checked.

A general impression of the reliability obtained in coding the ThinkAbout tests can be derived from the records maintained. Initially, in checking the coding of multiple-choice questions with specific responses, an error rate of less than 1 in 100 was detected. Afterwards all the coding was verified, and all errors were discussed with the coders. As a result, error rates were dramatically reduced. For open-ended questions inter-coder agreement was hard to achieve. On the average, disagreements occurred less than 5% of the time. These discrepancies also declined sharply after the initial stage.

The major disagreements (not necessarily errors) which reduced inter-coder reliability were borderline answers to open-ended questions which could be legitimately coded in one of two categories (e.g., season or elements; protection of whales or passage of laws). Detailed code books and regular meetings alleviated these problems considerably.

The problem was much easier with regard to the questionnaire data. A large majority of the questions in the questionnaire had forced-choice responses. A few responses were open-ended. All questionnaire coding was verified. The total proportion of coding errors, measured by values outside the coding parameters, was considerably less than .001 for the multiple-choice questions. These errors were corrected prior to computer data analysis.

The next phase in data management and quality control included data processing and data analysis. Data processing was conducted using an optical scan machine. The data output was checked manually against the original coded sheets for errors. The same machine also scores tests for the university, so any possible machine errors were immediately spotted and corrected. The accuracy rate of this machine was very high because of the precautions taken in marking the coding forms.

Prior to any quality checks on the data analysis, a visual check of all the printed forms for blanks and lack of uniformity was conducted. The next stage in the initial analysis was to run frequencies and compute averages for all the variables, using two different programs. Correspondence between the two was used as a reliability check. The SPSS statistical package was used in most of the analyses. SPSS has been used for almost 15 years on a large number of campuses. Therefore, the likelihood of mistakes in the analytic procedures was expected to be minimal.

If any computer printouts appeared to contain unreasonable or illogical results, the entire analysis was run again. In most cases, the second analysis corrected the original errors, which were mostly due to miscommunications between the computer analyst and project staff.

Limitations

In this report, as in any large-scale field research project, there are a number of important factors which must be taken into consideration when interpreting the findings.

The Testing Study

Only volunteer classrooms were used in this study, and those that were contacted were selected by state coordinators. Their choices were often teachers with whom they had had previous experience. The choice of which teachers used ThinkAbout and which did not occurred naturally, and no teachers were asked to use it for purposes of this study. Thus, there was no control over selection of sites or assignment to user or nonuser groups.

The budget for the study did not allow for close monitoring of test administration by project staff or the hiring of field examiners. In numerous cases, especially in Iowa and Pennsylvania, classroom teachers were the only examiners available. Every attempt was made to structure and standardize the administration of the tests, but variations inevitably occurred. Information was collected from examiners about the test administration process, but this information was self-reported.

The series was not available at the time the ThinkAbout tests were developed, and there was no experience with the use of ThinkAbout in classrooms. Thus, the test developer had only instructional design specifications on which to base his item writing. The time available for test development was short, and there were no students who had used ThinkAbout with whom the instruments could be pilot-tested. Two instruments, the measures of self-management and of effective communication, were not ready for fall testing, so only winter and spring data are available on those tests.

Coordinators from the four states were given only a limited budget ($2,500 per state) to cover their expenses. In Iowa and Mississippi the expenses of staff greatly exceeded the budget. Thus a great amount was donated to the research by these consortium members.

Since no prior experience with the ThinkAbout tests existed, the coding of student responses to the exercises depended on the responses received. Many decisions had to be made about how to group them. Many unexpected responses came from the student population. All these adjustments could have been avoided with a pilot effort with the new instruments. In addition, the sparsity of technical information about the ThinkAbout tests led to a decision not to emphasize, as would have been desirable, aggregations of student performance across items.

The amount of time teachers were willing to donate for testing during the year led to a modified testing plan wherein half a class was tested on half of the instruments and half on the other. This in turn led to logistical problems that made the job of test administrators even more difficult.

The turnaround time in getting CTBS scores back to teachers and also in preparing technical reports was affected by the need to have all test packets in hand before they could be sent away for scoring. The scoring time itself was typically four to six weeks once the tests were shipped.

The motivation of students and teachers in taking the tests was and remains unknown. But CTBS scores seem to indicate that the testing was taken seriously.

Contamination of nonuser classrooms is always a concern, and there is no knowledge about how many nonusers made use of ThinkAbout. Self-reports by teachers indicated that no contamination occurred, but some may have.

In summary, any interpretation of a large difference between users and nonusers in favor of users would have to consider the possibility that the difference was not due to ThinkAbout but to one or more of these other factors. A large difference in favor of nonusers could also be explained in several ways. The test findings do provide monitoring data from which hypotheses for later testing can be extracted.

The Surveys

No sampling frame existed at the beginning of the project to permit the drawing of probability samples. Thus the ability to make inferences from samples to a larger population did not exist. The respondents in the surveys were teachers and their students who happened to be identified as users during an intensive search in fall 1979. Since many teachers did not decide to use ThinkAbout until after school had begun, there was considerable lag time in building the sample frame.

The response rate on the surveys was affected by the use of "probable users" in constructing the mailing list. Often, probable users turned out to be nonusers.

The number of issues that could be addressed on short questionnaires was limited, and several issues had to give place to more important ones. Thus, not all the issues raised by consortium members and AIT staff could be addressed in the surveys.

In summary, this report cannot support inferences beyond the descriptive data. However, valuable insights can be gained from the information supplied by the respondents.

The Case Studies

As in any case study, the information reported and the interpretations made were functions of the field researchers' previous experiences and world view. The sites chosen for study also determined what was reported.

Some characteristics of the field researchers that might have affected their observations include their previous experiences in teaching, their perceptions of television and its use in the classroom, their style of working with others and conducting naturalistic research, their choices of reading over the years, and of course their training in research.

The budget for the case studies allowed support for a maximum of two people during most of the school year. In one location, the northwest, the year was divided between two people. More and different sites and more and different observers would have added to the knowledge gained from the case studies.

The sites selected were limited to those close to the home locations of the researchers. Site selection was also affected by the availability of teachers using ThinkAbout during its first year of broadcast and teachers willing to open up their classroom to outsiders.

In summary, it is uncertain how much of the knowledge in the case study reports will be found elsewhere. There are a number of factors which led to the particular descriptions and interpretations provided. However, the case study reports are rich with insights and lead to a number of hypotheses that are left to other research studies.

A general limitation that affected all three studies was the timing of the project. In 1979-80, ThinkAbout was in its first year of availability. In fact, the last programs were not produced until after January 1980. Many teachers, administrators, and media specialists were not aware of the existence of the series. No teachers had any previous teaching experience with ThinkAbout. There were problems in disseminating the preliminary teacher's guide, and then the teacher's guide in January.

One of the field researchers noted that this research was actually studying the introduction or distribution of ThinkAbout rather than its use as an instructional intervention. This was certainly true in early fall 1979.

To study ThinkAbout under ideal conditions, it would have been desirable to wait until the second year of availability. Many broadcast and distribution problems could have been eliminated, and training and awareness workshops could have been held. Moreover, there would have existed a cadre of teachers who had already used ThinkAbout once and who could plan their instruction with more confidence.

This discussion should not imply, however, that the research conducted in 1979-80 is unimportant. Before the project, there was no way to tell how *ThinkAbout* would be used in classrooms, how students would perform on unknown tests, how teachers and students would react to *ThinkAbout*, or what refinements in instructional television offerings needed to be made. There were no clues to the effects *ThinkAbout* was having on students and teachers. There were no suggestions about how to use *ThinkAbout* more effectively or how to distribute a series like it better in the future. These things now exist, along with much more information.

The three complementary methods provided different perspectives on the same phenomenon--the field use of *ThinkAbout* during its initial year of availability. Each method had its strengths and weaknesses, and these must be considered when the findings are interpreted. Some of the more salient strengths and weaknesses included:

Strengths

Testing

A large number of classrooms which were geographically widespread participated.

User and nonuser classrooms participated.

Multiple testing instruments were used, and classroom process data were gathered.

Test data were collected at three times during the year.

Surveys

A large number of teachers and students responded.

A large number of issues were addressed.

Surveys were conducted four times during the year.

Case Studies

Holistic reports of experiences during the first year of use in certain classrooms were generated.

Classrooms in different settings were studied.

A wide spectrum of variables and issues were studied.

Weaknesses

Testing	Surveys	Case Studies
Only volunteer classrooms were used.	Probability sampling could not be used limiting generalizability.	The number of sites and observers was limited.
No pilot testing of the tests was possible in ThinkAbout classrooms.	Not all users could be identified in constructing the mailing list.	The classrooms that were studied were taught by teachers willing to open up their classrooms to outsiders.
Time requirements and logistics of testing throughout the year were disruptive in participating classrooms.	Not every issue listed could be addressed by the surveys.	There is uncertainty about the extent to which findings will be seen elsewhere.

III. FINDINGS--THE TESTING STUDY

The information collected in the testing study is directed toward the accountability question: What evidence is there that student performance has been changed by ThinkAbout? Testing was done in fall, winter, and spring in classrooms where ThinkAbout was used and in classrooms where it was not used. The test instruments covered a wide range of generally recognized basic skills content as well as content for the four goal areas of ThinkAbout. Student attitudes toward problem solving were also measured at each of the three testing times.

This section begins with a summary of the context data from participating classrooms. Then descriptive summaries of the results of CTBS testing are presented for all of the students. A report of student performance on the ThinkAbout tests and the attitude scale is given by item. Finally, the results of the end-of-year questionnaire study of ThinkAbout users are reported.

Context Information[1]

A total of 221 useable questionnaires were returned with the fall testing packets. Of the ThinkAbout users, 89 were female and 29 were male; of the nonusers, 60 were female and 43 were male. Of the 103 nonusers, 62% held bachelor's degrees, 34% master's, and 3% specialist degrees. Of the 118 users, 68% had bachelor's degrees, 30% master's, and 2% specialist degrees.

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[1] Copies of the context questionnaires given to teachers who were about to use ThinkAbout and those who were not may be found in Appendix G.

Of the nonusers, 46% reported that they taught in self-contained classrooms, 23% in nontraditional classrooms, and 25% in departmentalized settings. Of the users, 56% taught in self-contained classrooms, 12% in nontraditional classrooms, and 30% in departmentalized settings. Of the nonusers, 40% indicated they had team-teaching assignments and 58% indicated not. Of the users, 21% team-taught and 78% did not.

The distribution of nonuser and user teachers in the testing study across sizes of community is shown in Table 8. It is evident that most of the classrooms that participated in the study were in smaller community settings.

Table 8

Distribution of Nonuser and User Teachers across Sizes of Community

	Number of Classroom	
	Nonusers	Users[a]
Large city, over 250,000 people	8	3
Suburb of large city	3	5
Middle-sized city, 50,000-250,000 people	10	16
Suburb of middle-sized city	14	8
Small city or town, less than 50,000 people	49	56
Rural area, not near a large or middle-sized city	19	27

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[a] Three users did not respond to this question.

When asked to rate the academic achievement of the students in their classes, 17% of those not using ThinkAbout responded above average, 71% average, and 14% below average. Of those using ThinkAbout, about 20% rated their classes above average, 55% average, and 10% below average. A few teachers did not respond to the question.

The socioeconomic status that teachers indicated best described their class was distributed as shown in Table 9. Evidently most classrooms in the study were middle-range SES.

Table 9

Distribution of Class Socioeconomic Status

	Number of Classrooms	
	Nonusers*	Users*
Lower	4	5
Lower middle	24	27
Middle	48	40
Upper middle	16	10
Upper	0	0
Considerably varied	7	14

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*Four nonusers and 22 users did not respond to this question.

Approximately 90% of both users and nonusers indicated that none of their students spoke English as a second language. The classrooms of both users and nonusers were predominantly white. Fourteen percent of the nonusers and 10% of the users indicated that their classrooms were over half black. Classrooms that were over half white were reported by 81% of the nonusers and by 66% of the users. Four user classrooms were 80% or more native American and three nonuser classrooms exceeded that percentage.

Teachers were also asked about their histories of using instructional television. Of the ThinkAbout nonusers, 54% said they had used ITV in the past and 45% said they had not. Of the ThinkAbout users, 83% had previously used ITV and 16% had not. ThinkAbout users rated the state of repair of television viewing equipment in their school to be excellent much more frequently than nonusers did (45% of the users, 17% of the nonusers). Similarly, the users indicated that television viewing equipment was always available when they needed it much more frequently than the nonusers did (64% users, 37% nonusers).

More users than nonusers felt that television was useful as an instrument resource (45% of the nonusers marked a 4 or a 5 on a five-point scale; 80% of the users did so).

About 20% of the teachers who were not going to use ThinkAbout in 1979-80 had used an instructional television series in the previous year and 35% of them were planning to use another instructional television series in 1979-80. Fifty percent of the users had used a series in 1978-79 and 60% of them were planning to use another instructional television series besides ThinkAbout in 1979-80.

In summary, although some differences showed up between the classrooms that were about to use ThinkAbout and those that were not, there were no noteworthy differences in the characteristics one would expect to be critical: community setting, SES, race, and teacher ratings of class achievement level.

CTBS Subtest Findings

The seven subtests of Level 2, Form 5 of the CTBS that were used in the study were the following:

1. Test 2--reading comprehension
2. Test 5--language expression
3. Test 7A--mathematics concepts
4. Test 7B--mathematics applications
5. Test 8--reference skills
6. Test 9--science
7. Test 10--social studies.

The results of analyses of data from these subtests are reported below.

1. Reading comprehension (45 items). The average performance level of all fifth grade students in user classrooms was 27.8 items correct in the fall and 30.7 items correct in the spring. This put the "typical" fifth grade student user at the 61st percentile in the fall and at the 58th percentile in the spring. Fifth grade students in classrooms where ThinkAbout was not used averaged 27 items correct in the fall and 29.5 correct in the spring. This put the "typical" fifth grade student nonuser at the 58th percentile in the fall and at the 56th percentile in the spring. Neither group showed noticeable movement in their placement within the national norms during the school year. An analysis of covariance, adjusting for fall test differences, failed to show any statistically significant difference between treatment effects (users versus nonusers) on this test.[2]

Graphs showing classroom performance levels in reading comprehension by state and ThinkAbout treatment (users versus nonusers) are provided in Appendix H.

The average performance level for all sixth grade students in classrooms where ThinkAbout was used was 30.9 items correct in the fall and 31.9 items correct in the spring. These levels correspond to the 53rd percentile (fall) and the 52nd percentile (spring). In contrast, the "typical" sixth grade student in a classroom where ThinkAbout was not being used scored 30.5 items correct in the fall and 30.9 items correct in the spring. These levels correspond to the 53rd percentile in the fall and the 49th percentile in the spring.

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[2] Tests for homogeneity of regression slopes were run for all ANCOVAs. No evidence of violating the assumption was found.

An analysis of covariance, adjusting for fall performance differences, showed no statistically significant difference in performance by the two groups in the spring.

Graphs showing sixth grade classroom performance levels across the three testing times by state and ThinkAbout treatment may be found in Appendix H.

It is evident from this testing information that performance on the overall reading comprehension test was not influenced by the presence (or absence) of ThinkAbout.

2. Language expression (35 items). Fifth grade students in ThinkAbout classrooms scored 22.5 items correct in the fall and fifth graders in nonuser classrooms scored 22.9 items correct. This corresponded to a percentile rank of 63. In the spring, fifth graders in ThinkAbout classrooms scored 24.7 items correct and those in nonuser classrooms scored 25.1 items correct. The percentile ranks were approximately 66 each. An analysis of covariance on spring scores, adjusted for fall performance differences, yielded no statistically significant difference.

Graphs of fifth grade performance over the three testing times by state and treatment group are provided in Appendix H.

At the sixth grade level, the "typical" fall performance for students in ThinkAbout classrooms was 24.4 items correct, corresponding to the 58th percentile. In the spring, the "typical" performance for sixth grade students in ThinkAbout classrooms was 25.8 items correct, corresponding to about the 62nd percentile. Meanwhile, sixth graders in classrooms where ThinkAbout was not being used scored 24.4 items correct, at about the 53rd percentile. An analysis of covariance on the spring test scores, adjusting for differences in the fall, indicated no statistically significant difference between treatment groups.

Graphs for sixth grade performance over the three testing times by state may be found in Appendix H.

There is no indication from these data that the ThinkAbout series affected performance levels on the overall language expression test.

3. Mathematics concepts (25 items). In the fall, fifth grade students in the classrooms about to use ThinkAbout scored an average of 14.8 items correct, approximately the 57th percentile. Students who were not going to use ThinkAbout scored an average of 14.1 items correct, approximately the 50th percentile. In the spring, fifth grade students in ThinkAbout classrooms scored 16.3 items correct and nonusers scored 15.5 items correct. These scores correspond to about the 57th and 51st percentiles respectively. When adjusted for pretest differences, the post-test differences between user and nonuser classrooms were not statistically significant.

Graphs for performance level changes of fifth graders on the mathematics concepts test by state and treatment are provided in Appendix H.

For the sixth grade, fall test levels were 16.3 items correct for both ThinkAbout and nonuser classrooms. A score of 16.3 corresponds to about the 52nd percentile. In the spring, ThinkAbout classrooms scored 18 items correct and classrooms where ThinkAbout was not used scored 17.3 items correct. These scores correspond to percentiles of approximately 56 and 51 respectively. Although an analysis of covariance indicated no statistically significant difference on the adjusted post-test scores, it did indicate a change in the anticipated direction which may be more pronounced when item performances are looked at. Item data summaries are presented later in this section.

Graphs for the four states of sixth grade performance levels on the mathematics concepts test over the school year may be found in Appendix H.

4. Mathematics applications (25 items). Fall test performance for students in fifth grade classrooms planning to use ThinkAbout was 14 items correct. For students in classrooms not planning to use ThinkAbout, it was 13 items correct. The percentile ranks for these scores were 56 and 51 respectively. In the spring, students in classrooms which had used ThinkAbout scored 14.5 items correct and students in classrooms which had not used ThinkAbout scored 13.4 items correct. The corresponding percentile ranks for these scores were about the 49th and 44th percentiles respectively. An analysis of covariance on the post-test scores, adjusting for pretest differences, showed no statistically significant difference between treatment groups.

Graphs for fifth grade performance on the mathematics applications test by state and treatment group are provided in Appendix H.

The "typical" sixth grade ThinkAbout classroom scored 16.1 items correct in the fall, about the 51st percentile, and 17.4 items correct in the spring, about the 48th percentile. The "typical" classroom not using ThinkAbout scored 15.7 items correct in the fall, about the 48th percentile, and 16.4 items correct in the spring, about the 44th percentile. An analysis of covariance on post-test differences between treatment groups, adjusting for pretest differences, showed no statistically significant difference between groups.

Graphs of sixth grade test performance in mathematics applications by state and treatment group during the school year are provided in Appendix H.

5. *Reference skills (20 items)*. In the fall, fifth grade students in *ThinkAbout* classrooms scored 12.4 items correct (approximately the 55th percentile) and students in classrooms that were not going to use *ThinkAbout* scored 13 items correct (approximately the 59th percentile). In the spring, students who had been in *ThinkAbout* classrooms scored 14.7 items correct (approximately the 64th percentile) and students not in *ThinkAbout* classrooms scored 14.2 items correct (approximately the 61st percentile). Although an analysis of covariance indicated no statistically significant difference between treatment group post-test means adjusted for pretest differences, there is a change in the intended direction. An inspection of item performance levels may be revealing.

Graphs for fifth grade performance during the year on the reference skills test by state and treatment group are provided in Appendix H.

Sixth grade students in classrooms where *ThinkAbout* was going to be used scored 14.9 items correct in the fall, approximately the 61st percentile, and 15.5 items correct in the spring, again approximately the 61st percentile. Sixth graders not in *ThinkAbout* classrooms scored 14.1 items correct in the fall, approximately the 56th percentile, and 14.4 items correct in the spring, approximately the

52nd percentile. An analysis of covariance revealed no statistically significant difference between treatment group performance levels in the spring after adjusting for differences in the fall.

Graphs for sixth grade performance on the reference skills test during the year by state and treatment group may be found in Appendix H. Differences found in state performances are especially pronounced.

6. *Science (36 items)*. The fall performance level for fifth grade students in classrooms that were going to use *ThinkAbout* was 18.5 items correct, approximately the 62nd percentile. The performance level for fifth grade students in classrooms that were not going to use *ThinkAbout* was 18.8 items correct, approximately the 63rd percentile. Spring testing results indicated that students in *ThinkAbout* classrooms averaged 20.8 items correct, approximately the 57th percentile, and students in classrooms not using *ThinkAbout* averaged 20.9 items correct, again approximately the 57th percentile. An analysis of covariance indicated no statistically significant difference between treatment group adjusted post-test performance levels. There is no indication that *ThinkAbout* affected overall science test performance for fifth graders.

Graphs for science test performance for fifth graders during the school year by state and treatment group are provided in Appendix H.

Sixth grade classrooms that were going to use *ThinkAbout* scored 21.1 items correct in the fall (approximately the 62nd percentile) and those that were not going to use *ThinkAbout* scored 20.4 items correct (approximately the 59th percentile). In the spring, sixth graders in ThinkAbout classrooms scored 23.3 items correct (approximately the 66th percentile) and those in nonuser classrooms scored 21.6 items correct (approximatley the 57th percentile). Although an analysis of covariance revealed no statistically significant difference between adjusted treatment group spring means, there is a change in the intended direction that an inspection of test item performance may support.

Graphs for sixth grade test performance during the year on the science test by state and treatment group are provided in Appendix H.

7. Social studies (37 items). Fall test performance for fifth grade students in ThinkAbout classrooms was 18.9 items correct (approximately the 60th percentile) and their spring test performance was 20.8 items correct (approximately the 57th percentile). Fall performance for students in classrooms not using ThinkAbout was 18.5 items correct (approximately the 59th percentile) and their spring performance was 19.8 items correct (about the 53rd percentile). An analysis of covariance revealed no statistically significant difference between treatment group adjusted post-test performance levels.

Graphs of fifth grade social studies performance over the school year by state and treatment group may be found in Appendix H.

Fall performance in social studies for sixth grade classrooms that were going to use ThinkAbout was 21.2 items correct, corresponding to approximately the 53rd percentile. Spring performance for the same group was 23.4 items correct, corresponding to approximately the 58th percentile. In sixth grade classrooms not using ThinkAbout, students averaged 21.4 items correct in the fall, corresponding to approximately the 53rd percentile. In the spring, they averaged 22.5, corresponding to approximately the 54th percentile.

An analysis of covariance on the adjusted post-test differences in treatment groups reveals no statistically significant difference, although change in the intended direction may have occurred. An inspection of performance levels on social studies items might be revealing.

Graphs for the social studies performance of sixth graders during the year by state and by treatment group may be found in Appendix H.

In addition to a look at the comparative performance between user and nonuser classrooms on the seven CTBS tests, an analysis was done on the absolute increases observed on those tests for each type of classroom. A minimum criterion of one-half standard deviation increase (for the fall nonuser group) by state was used in counting how many classrooms in the user and nonuser groups increased. A one-half standard deviation increase was typically a two-to-three item change in the classroom average from fall to spring, depending on the test and the state analyzed. Table 10 provides the findings from this analysis. Information by state is provided in Appendix I. No noteworthy increases in user classrooms that were not found in nonuser classrooms appeared in the seven CTBS test totals. Although this was another way of looking at the impact of ThinkAbout on the CTBS scores, the result was the same as before: no striking patterns in the intended direction emerged from the analysis.

Table 10

CTBS Performance of User and Nonuser Classrooms

Relative to the Fall-Spring Change Criterion Level (.5Sx)[*]

		Grade 5		Grade 6	
		>.5Sx Increase	<.5Sx Increase	>.5Sx Increase	<.5Sx Increase
Reading comprehension	Users	n = 18	n = 39	n = 7	n = 44
	Nonusers	n = 12	n = 32	n = 10	n = 32
Language expression	Users	n = 19	n = 39	n = 9	n = 41
	Nonusers	n = 16	n = 30	n = 6	n = 32
Mathematics concepts	Users	n = 25	n = 32	n = 15	n = 35
	Nonusers	n = 18	n = 26	n = 8	n = 25
Mathematics applications	Users	n = 16	n = 41	n = 8	n = 42
	Nonusers	n = 11	n = 33	n = 6	n = 36
Reference skills	Users	n = 32	n = 25	n = 12	n = 38
	Nonusers	n = 18	n = 26	n = 9	n = 29
Science	Users	n = 19	n = 39	n = 15	n = 35
	Nonusers	n = 12	n = 34	n = 8	n = 30
Social studies	Users	n = 19	n = 28	n = 10	n = 40
	Nonusers	n = 13	n = 30	n = 6	n = 36

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[*] The number of classrooms reported for each subtest varies slightly because of missing data for a few classrooms on certain subtests in either fall or spring.

CTBS Item Findings

Every test item on each of the seven CTBS subtests was inspected for significantly greater performance at the end of the year by students in classrooms using *ThinkAbout* than by students in classrooms not using *ThinkAbout*. Whenever such a difference was found, winter and fall data on the same item were examined to determine whether a difference existed prior to the end of the year. If a spring difference existed in the direction sought ($\geq p = .05$ level of significance), and no difference or a difference in the opposite direction existed in fall or winter, the item was highlighted as a possible effect. This analysis was done separately for the two grades.

The purpose of this analysis was to seek any patterns of achievement that could be linked to *ThinkAbout*. If a pattern existed, it might aid in understanding the impact of the series. The results of the analysis are provided in Appendix J.

The number of CTBS test items that met the search criteria was small, and those that were identified could represent Type I errors. Most CTBS items showed no significant difference in performance between user and nonuser classrooms in the spring. If *ThinkAbout* has an effect on basic skills test performance, the items listed in Appendix J represent the most likely locations of the effect.

ThinkAbout Test Findings

A large number of items, variables, and exercises were analyzed on the *ThinkAbout*-specific tests. This report of findings is limited to the identification of items and total response scores for exercises where a significant difference was found between user and nonuser classrooms in the spring. The extensive volume of printouts generated for these tests was simply too massive to permit the inclusion of all findings.

1. Attitudes towards Problem Solving (30 items)

This attitude inventory was developed by Dr. Martin Covington for the Agency for Instructional Television specifically for use in this research project. The instrument contains 30 statements related to problem solving that require a response using a five-point Likert-type scale (strongly agree-agree-?-disagree-strongly disagree). A copy of this strument is provided in Appendix B.

An analysis of item data for user and nonuser classrooms in the fall showed a significant difference between fifth grade user and nonuser classrooms on one item (29) where the user classrooms averaged 2.97 and the nonuser classrooms averaged 2.79 on a five-point scale (p = .004). This item read as follows:

> Having too many ideas for solving a problem can be just as bad as having no ideas at all.

At the sixth grade level, items 5 (user average = 2.68, nonuser average = 2.52, p = .04), 17 (user average = 3.13, nonuser average = 2.99, p = .02), and 29 (user average = 3.09, nonuser average = 2.92, p = .01) revealed significant differences. These items read as follows:

> 5. It's best to stick with one idea. Students may become confused by too many ideas.
>
> 17. Ideas just seem to "come to you," and there isn't much you can do to get more.
>
> 29. Having too many ideas for solving a problem can be just as bad as having no ideas at all.

In winter, a significant difference was found at the fifth grade level for item 12 (user average = 2.17, nonuser average = 1.97, p = .02). This item read as follows:

> When I am working on a problem, I usually like to figure things out by myself instead of getting my ideas from others.

At the sixth grade level, significant differences were found for items 5 (user average = 2.82, nonuser average = 2.45, p = .01), 11 (user average = 3.86, nonuser average = 3.60, p = .04), 13 (user average = 3.02, nonuser average = 2.73, p = .02), 20 (user average = 3.69, nonuser average = 3.47, p = .04), 23 (user average = 1.77, nonuser average = 1.96, p = .02), and 30 (user average = 3.41, nonuser average = 3.15, p = .04). These items read as follows:

5. It's best to stick with one idea. Students may become confused by too many ideas.

11. Some students are just naturally poorer at thinking than others, and there is not much they can do to improve.

13. I usually would rather work on problems I know I can solve than on ones that may be too hard for me.

20. If you don't have any good ideas after working on a problem a while, you will not be likely to get any.

23. I am eager to learn.

30. It is best to let others give their ideas first so you will not make the same mistakes they do.

In spring, a significant difference was found at the fifth grade level for item 26 (user average = 2.82, nonuser average = 2.62, p = .02). This item read as follows:

> I often keep my ideas to myself because I think others may laugh at them.

At the sixth grade level, significant differences were found between user and nonuser classrooms on items 3 (user average = 3.47, nonuser average = 3.20, p = .035), 15 (user average = 3.68, nonuser average = 3.47, p = .05), 22 (user average = 3.52, nonuser average = 3.30, p = .05), and 30 (user average = 3.32, nonuser average = 3.11, p = .05). These items read as follows:

3. Problems are unfair that have more than one right way of solving them.

15. Students who find it hard to work with ideas should be allowed to do other things in school.

22. Students should keep ideas to themselves until they know they are right.

30. It is best to let others give their ideas first so you will not make the same mistakes they do.

The patterns of item responses for the average user and nonuser classrooms over the three testing times are provided by grade in Appendix K.

User and nonuser classrooms followed a similar pattern of change in response to ATPS items during the year. Where significant differences between user and nonuser classrooms existed, the absolute difference in average response was small. Significant differences that appeared in winter disappeared in spring, except for item 30 at the sixth grade level. An analysis of covariance showed that little of the variance in the average classroom spring response to each item could be accounted for by the average classroom fall response, the use or nonuse of ThinkAbout, or the grade level of the classroom. These findings revealed no noteworthy patterns of change that might be attributed to ThinkAbout.

2. Problem-Solving Exercises--Item Results

There were three problem-solving instruments developed for use in this study, each with two forms, B and C. Each instrument presented a different stimulus situation and required unique responses. Each of the students responding to the instruments always had the same form but received a different exercise at each testing time (fall, winter, and spring). Copies of the instruments are provided in Appendix B. Since the instruments contained unique problem situations and called for unique responses, they were not considered alternative or equivalent forms of the same test. Each instrument did have a common set of attitude items intended to measure confident thinking. In this analysis every item was analyzed separately.

A. Maria's Vegetable Garden, Form B. At the fifth grade level, one item on the instrument produced a significant difference in the spring that did not exist in the fall. The item was on page 4 where ideas were to be evaluated:

> Maybe Maria planted too many beets in the box.

On a three-point scale (poor-good), user classrooms averaged 2.14 and nonuser classrooms averaged 2.32 ($p = .05$).

At the sixth grade level, two items on the instrument produced significant differences in the spring that did not exist in the fall. The items were on pages 2 and 3:

> (Page 2:) What questions might you want to ask about Maria's story and the problems?

The average number of non-redundant relevant responses by user classrooms was 1.86 and the average for nonuser classrooms was 1.54 ($p = .05$).

> (Page 3:) Maria decides to figure out what might be causing the leaves to turn brown. You help Maria.

> Write down all the reasons you can to explain this.

The average number of ideas that did not fit predetermined scoring categories (water, elements, season, soil, pests) by user classrooms was .78 and the average for nonuser classrooms was .54 (p = .02).

B. Maria's Vegetable Garden, Form C. At the fifth grade level, three items on the instrument revealed significant differences in the spring between user and nonuser classrooms that did not exist in the fall. These items were on pages 3 and 4 of the instrument.

> (Page 3:) Maria decides to plant more beets. But first, what things might Maria do to make sure the new beets do not die? Write your ideas below.

The average number of responses implying seasonal characteristics for user classrooms was .05; the average for nonuser classrooms was .007 (p = .03).

> (Page 4:) Below are ideas for explaining why the beets might have died. How might Maria check each idea to see if it is a good answer? Maybe some one dropped the box and hurt the beets. What different things might Maria do to check this idea?

The average number of appropriate ideas generated by user classrooms was .67, and by nonuser classrooms .52 (p = .05).

On the same page, in response to the idea that the beets may have died because Maria planted too many beets in the box:

> Where might Maria look for the facts to decide? Write your ideas below.

The average number of appropriate responses for user classrooms was .97 and for nonuser classrooms was .63 (p = .007).

At the sixth grade level, two items on the instrument revealed significant differences between user and nonuser classrooms in the spring that did not exist in the fall. One of the items was on page 3, where a significant difference was also found in fifth grade:

> Maria decides to plant more beets. But first,
> what things might Maria do to make sure the new
> beets do not die? Write your ideas below.

The average number of responses implying seasonal characteristics by user classrooms in sixth grade was .08 and the average for nonuser sixth grade classrooms was .02 (p = .01). The other item was on page 2 of the instrument:

> What are some of the different things Maria
> might do to solve her problem? Write them below.

The average number of ideas that did not fit predetermined scoring categories for user sixth grade classrooms was .33 and for nonuser sixth grade classrooms was .14 (p = .006).

C. Brian's Doormats, Form B. At the fifth grade level, four items on the instrument revealed significant differences between user and nonuser classrooms in the spring that did not exist in the fall. The items were on pages 2, 4, and 6 of the instrument. On page 2, when given the following possible step for Brian, students were to respond to the item on a four-point scale (very poor-poor-good-very good):

> Brian might wonder why some of the cookies were
> too close to the top of the oven.

The average response on the scale for fifth grade user classrooms was 2.47 and for nonuser classrooms was 2.65 (p = .04). On page 6, two attitude items developed to measure confident thinking revealed significant differences:

> Compared to the other students how well did you do?
> 1 2 3 4 5
> (very poor - poor - fair - well - very well)

How happy are you with your ideas?

1 2 3 4 5
(very unhappy - unhappy - fair - happy - very happy)

On the first item, user classrooms averaged 3.29 and nonuser classrooms averaged 3.58 (p = .02). On the second item, user classrooms averaged 3.67 and nonuser classrooms averaged 3.92 (p = .04).

At the sixth grade level, two items on the instrument revealed significant differences between user and nonuser classrooms in the spring that did not exist in the fall. The items were on pages 3 and 5 of the instrument. On page 3, students were asked to write down all the reasons that could explain why Brian's cookies burned. The average number of ideas in the category of patterns of cookie arrangements for user classrooms was .97 and the average for nonuser classrooms was .77 (p = .04). On page 5, students were told:

> Maybe the cookies burned because the temperature in the oven was higher than what the oven dial said. What facts tell you that this is probably not a good answer?

The average number of appropriate responses for user classrooms was .16 and for nonuser classrooms was .08 (p = .05).

D. Brian's Doormats, Form C. At the fifth grade level, there were no items on the instrument that showed significant differences between user and nonuser classrooms in the spring but no significant difference in the fall.

At the sixth grade level, there were three items on the instrument that showed significant differences in the spring but none in the fall. On page 2, students were asked to list some of the different things Brian might do to solve his problem. The average number of students responding "give up" in user classrooms was .15 and in nonuser classrooms was .07 ($p = .03$). On page 3, students were asked what things Brian might do to make sure the new batch of cookies does not burn. The average number of ideas falling into the "other ideas" category for user classrooms was 1.08 and the average for nonuser classrooms was .85 ($p = .02$). On page 4, students were asked to put an X mark in front of each listed idea that was a different explanation for why the cookies burned from not following the receipe. For the idea "Maybe Brian used a dirty mixing bowl," the average response for user classrooms was .62 and for nonuser classrooms it was .49 ($p = .04$).

E. Mystery of the Whales, Form B. No items on the instrument showed significant spring differences for either fifth or sixth grade classrooms when no difference was seen in the fall.

F. Mystery of the Whales, Form C. At the fifth grade level, one item on the instrument showed a significant difference in the spring after no difference was observed in the fall. On page 4, students were asked to indicate how scientists might check the idea that hunters may have killed the whales for their meat and oil as an explanation of why the whales might have died. The average number of non-duplicative, acceptable ideas for user classrooms was .63 and for nonuser classrooms was .50 ($p = .04$).

At the sixth grade level, six items showed a significant difference in the spring after no difference was observed in the fall. On page 2, students were asked to write some different things that Niki and the scientists might do to solve the problem. The average for user classrooms in the response category of identifying corrective steps was .66 and the average for nonuser classrooms was .39 (p = .01). On the same item, the average for user classrooms in the response category of conduct observations, or experiments on whales, was .76 and the average for nonuser classrooms was .55 (p = .05). On the same item, the average for user classrooms in the response category "other suggestions" was .16 and for nonuser classrooms it was .07 (p = .03). On page 3, students were asked to suggest different things that scientists might do now to prevent other whales from dying the same way. The average for user classrooms in the response category of using public appeals was .25 and the average for nonuser classrooms was .11 (p = .05). On page 4, students were asked to mark an X in front of each idea that was a different approach from using humans harming the whales as an explanation of why the whales died. For the following:

> Maybe the whales swam too close to shore and were trapped when the tide went out.

the average for user classrooms was .81 and for nonuser classrooms was .71 (p = .05). Finally, on page 5, when students were asked how hard they tried on this instrument, the average response for user classrooms on a five-point scale (1 = very little, 5 = very hard) was 3.83 and the average for nonuser classrooms was 3.57 (p = .04).

Problem-Solving Exercises--Total Responses

On Form B of each of the three problem-solving instruments, the first question required students to demonstrate their question-asking skills. In the spring testing, there was no significant difference in these skills between user and nonuser classrooms at the fifth grade level on any of the three instruments. At the sixth grade level, there was a significant difference in the spring on the Mystery of the Whales instrument. User classrooms averaged 3.66 acceptable questions and nonuser classrooms averaged 3.23 (p = .03). This difference did not exist at earlier testing times.

On Form C of each of the three problem-solving instruments, the first question required students to identify the problem. In the spring testing there was a significant difference in this skill between user and nonuser classrooms at the fifth grade level on the Maria's Vegetable Garden instrument. User classrooms averaged 1.57 acceptable responses and nonuser classrooms averaged 1.31 (p = .04). This difference did not exist at earlier testing times. At the sixth grade level, a significant difference in problem identification existed in the spring on the Brian's Doormats instrument. User classrooms averaged 1.82 acceptable responses and nonuser classrooms averaged 1.37 acceptable responses (p = .02). This difference did not exist at earlier testing times.

On Form C of each of the three problem-solving instruments, the second question required students to identify different problem solutions. No significant differences in this skill were found for fifth grade classrooms in the spring. At the sixth grade level, a significant difference in this skill between user and nonuser classrooms was found in the spring on the Brian's Doormats instrument. User classrooms averaged 3.44 acceptable responses and nonuser classrooms averaged 3.04 (p = .01).

Also on Form C of each of the three problem-solving instruments, the third question required students to generate ideas about how to avoid the problem. No significant differences in that skill were found at the fifth grade level in the spring, but at the sixth grade level a significant difference was found between user and nonuser classrooms on the Brian's Doormats instrument. User classrooms averaged 4.04 acceptable responses and nonuser classrooms averaged 3.62 ($p = .02$).

3. Effective Expression Exercises--Item Results

There were two effective expression instruments developed for use in this study, each with two forms, A and B. Each instrument presented a different stimulus situation and required unique responses. Each of the students responding to the instruments always had the same form but received a different exercise at each of the two testing times, winter and spring. These instruments were not available for fall testing. Copies of the instruments are provided in Appendix B. Since the instruments presented unique situations and called for unique responses, they were not considered alternative or equivalent forms of the same test. Each instrument, however, did have a common set of attitude items, intended to measure confidence in thinking. In this analysis every item was analyzed separately.

A. The Deadly Drink, Form A. At the fifth grade level, no items on this instrument showed significant differences between user and nonuser classrooms in the spring.

At the sixth grade level, five items showed significant differences between user and nonuser classrooms in the spring. On page 2 of the instrument, students were asked to write a short note warning parents of the danger of poisons and what to do about them. User classrooms outperformed nonuser classrooms in four (out of nine) response categories. (See Table 11.)

Table 11

Significant Differences on The Deadly Drink,

Form A, Question 2, at the Sixth Grade Level

Response Category (dichotomous scoring)	User Classroom Average (n = 58)	Nonuser Classroom Average (n = 52)	p =
1. Clear specification of danger	.72	.62	.05
2. Suggested securing poisons, placing them out of danger	.84	.75	.04
3. Used a dramatic form of communication	.37	.24	.02
4. Used proper format for a letter	.86	.76	.01

In response to the question on page 3 about how important being lucky is in doing well on this exercise, the user classroom average on a three-point scale (1 = not important, 3 = very important) was 1.23 and the nonuser classroom average was 1.41 (p = .01).

B. The Deadly Drink, Form B. At the fifth grade level, significant differences between user and nonuser classrooms in the spring were found on five items. In response to the instruction on page 2 to list how they might warn people about the danger of poisons and the prevention of accidents, user classrooms outperformed nonuser classrooms in two (out of four) response categories. (See Table 12.)

Table 12

Significant Differences on The Deadly Drink,

Form B, Question 2, at the Fifth Grade Level

Response Category (dichotomous scoring)	User Classroom Average (n = 69)	Nonuser Classroom Average (n = 55)	p =
1. Use public media	.30	.10	.001
2. Use public notices	.20	.12	.03

In response to the question on page 3 about what things Alfredo should do to prepare and give the best speeches possible, user classrooms and nonuser classrooms were significantly different in two (out of six) response categories. (See Table 13.)

Table 13

Significant Differences on The Deadly Drink,

Form B, Question 3, at the Fifth Grade Level

Response Category (dichotomous scoring)	User Classroom Average (n = 69)	Nonuser Classroom Average (n = 55)	p =
1. Get ideas from others	.05	.17	.02
2. Make speech understandable	.23	.09	.002

Finally, in responding to the question, "How smart are you at problems like these?" user classrooms averaged 3.67 and nonuser classrooms averaged 3.50 (p = .04) on a five-point scale (1 = very poor, 5 = very good).

At the sixth grade level, significant differences between user and nonuser classrooms in the spring were found on seven items. In response to the instruction on page 2 to list how they might warn people about the danger of poisons and the prevention of accidents, user classrooms outperformed nonuser classrooms in three (out of four) response categories. (See Table 14.)

Table 14

Significant Differences on The Deadly Drink,

Form B, Question 2, at the Sixth Grade Level

Response Category (dichotomous scoring)	User Classroom Average (n = 57)	Nonuser Classroom Average (n = 52)	p =
1. Use public media	.19	.05	.002
2. Use direct contact	.84	.64	.04
3. Use public notices	.22	.12	.003

In response to the question on page 3 about what things Alfredo should do to prepare and give the best speeches possible, user classrooms averaged .27 in the response category "use a demonstration in the speech" (dichotomous scoring) and nonuser classrooms averaged .42 (p = .02). On the last page of the instrument, where students were asked to express their feelings about this problem on a five-point scale (1 = very little, 5 = very much), user and nonuser classrooms responded differently to two questions. (See Table 15.)

Table 15

Significant Differences on The Deadly Drink, Form B, Question 4, at the Sixth Grade Level

Question	Average User Classroom Response (n = 57)	Average Nonuser Classroom Response (n = 52)	p =
1. How much of your ability do you use?	3.44	3.69	.02
2. How hard did you try?	3.55	3.77	.04

Finally, in responding to how important being lucky is for doing well on this problem, user classrooms on a three-point scale (1 = not important, 3 = very important) averaged 1.18 and nonuser classrooms averaged 1.30 (p = .04).

C. The Deadly Refrigerator, Form A. No items showed a significant difference between user and nonuser classrooms in the spring at either the fifth or the sixth grade level.

D. The Deadly Refrigerator, Form B. At the fifth grade level, no items with significant differences were found in the spring.

At the sixth grade level, two items revealed significant differences. On page 2, where students were asked how they might warn the groups, user classrooms averaged .24 in the response category of "use public notices" (dichotomous scoring) and nonuser classrooms averaged .13 (p = .002). On page 3, in responding to the question of what things Carlos should do to prepare and give the best speeches possible, user classrooms averaged .26 in the response category "make sure that speech is understandable" (dichotomous scoring) and nonuser classrooms averaged .14 (p = .02).

Effective Expression Exercises--Total Responses

On Form A of each of the two effective expression instruments, the first question required students to write a note of warning. Over all criteria for judging the content of this communication, a significant difference was found in the spring on the Deadly Refrigerator instrument between user and nonuser classrooms at the fifth grade level. The average number of acceptable suggestions raised by user classrooms was 1.88 and the average for nonuser classrooms was 1.63 (p = .03). No significant differences were found at the sixth grade level.

On Form B of each of the two effective expression instruments, the first question required students to identify groups they should warn. A significant difference in this skill was found at the fifth grade level on the Deadly Drink instrument. The average number of groups identified for user classrooms was 1.46 and the average for nonuser classrooms was 1.13 (p = .02). No significant difference was found in this skill at the sixth grade level.

The second question on Form B required students to identify methods for warning people. A significant difference in the total number of acceptable responses for this skill was found at both the fifth and sixth grade levels on the Deadly Drink instrument and at the sixth grade level on the Deadly Refrigerator instrument. The average total acceptable responses were as shown in Table 16.

Table 16

Significant Differences on Effective Expression Exercises,

Form B, Question 2, at the Fifth and Sixth Grade Levels

Grade	Instrument	Average User Total	Average Nonuser Total	p =
5	Deadly Drink	1.37	0.88	.001
6	Deadly Drink	1.38	1.00	.01
6	Deadly Refrigerator	1.50	0.95	.001

The third question on Form B required students to identify the steps involved in preparing a speech. A significant difference between user and nonuser classrooms in this skill was found at the sixth grade level in the spring on the Deadly Refrigerator instrument. The average number of acceptable steps identified by user classrooms was 1.85 and the average for nonuser classrooms was 1.43 (p = .02).

4. Self-Management Exercises--Item Results

There were two self-management instruments developed for use in this study, each with two forms, A and B. Each instrument presented a different stimulus situation and required unique responses. Students responding to the instruments always had the same form but received a different exercise at each of the two testing times, winter and spring. These instruments were not available for fall testing. Copies of the instruments are provided in Appendix B. Since the instruments presented unique situations and called for unique responses, they were not considered alternative or equivalent forms of the same test. Each instrument, however, did have a common set of attitude items, intended to measure confident thinking. In this analysis, every item was analyzed separately.

A. Jan's Report, Form A. At the fifth grade level, one item on the instrument showed a significant difference in the spring. On page 3 of the instrument, students were asked where Jan might go and whom she might talk to in order to find out about Indian customs and beliefs. In the response category "talk to Indians" (out of seven response categories), user classrooms averaged .57 ideas and nonuser classrooms averaged .47 ($p = .04$).

No items on this instrument showed a significant difference at the sixth grade level.

B. Jan's Report, Form B. At the fifth grade level, no items on the instrument showed a significant difference in spring performance for user and nonuser classrooms.

At the sixth grade level, a significant difference was found on two items. On page 2 of the instrument, students were asked to write the steps leading up to giving a report in class. In one response category, "assembling necessary equipment and resources" (out of nine response categories), nonuser classrooms identified this step .15 times on the average and user classrooms identified it .07 times ($p = .03$). On the last page, where students were asked, "How happy are you with your ideas?" the average response for user classrooms was 4.0 on a five-point scale (1 = very unhappy, 5 = very happy) and the average response for nonuser classrooms was 3.74 ($p = .005$).

C. Jim's Spacecraft, Form A. At the fifth grade level, one item on the instrument showed a significant difference in performance between user and nonuser classrooms in the spring. On page 3 of the instrument, students were asked where Jim might go and whom he might talk to in order to find out the Science Fair deadline. Nonuser classrooms gave the response "ask parents or relatives"

.10 times on the average and user classrooms gave it .06 times (p = .04). There were seven response categories for this item.

At the sixth grade level, two items on the instrument showed a significant difference between user and nonuser classrooms in the spring. On page 2 of the instrument, students were asked to list things that Jim might want to know in order to set up a plan. User classrooms provided the response "time considerations" 2.13 times on the average and nonuser classrooms provided it 1.91 (p = .04). On page 3 of the instrument, students were asked where Jim might go and whom he might talk to in order to find out the Science Fair deadline. Responses falling into the category "other ideas" averaged .06 for user classrooms and .02 for nonuser classrooms (p = .05). There were seven response categories for this item.

D. Jim's Spacecraft, Form B. At the fifth grade level, a significant difference between user and nonuser classrooms was found in the spring on these items. On page 2 of the instrument, students were asked to list steps preceding the job of painting his spacecraft. In the response category "getting information and/or advice," user classrooms averaged .14 responses and nonuser classrooms averaged .07 responses (p = .01). On page 3 of the instrument, students were asked to list what things Jim should do after he suddenly finds out that the Science Fair deadline is sooner than he was told. In the category "work harder, faster, longer," user classrooms averaged .47 responses and nonuser classrooms averaged .35 responses (p = .01).

In the category "reduce the scope of the project," user classrooms averaged .54 responses and nonuser classrooms averaged .38 responses (p = .04). In the same category at the sixth grade level, user classrooms averaged .61 responses and nonuser classrooms averaged .40 responses (p = .005). There were eight response categories for this item. No other significant differences between user and nonuser classrooms were found on this instrument in the spring at the sixth grade level.

Self-Management Exercises--Total Responses

On Form A of each of the self-management instruments, the first question required students to list questions that they would need to ask to get information required to set up a plan. At the fifth grade level, a significant difference between user and nonuser classrooms in the average number of questions listed was found in the spring on the Jan's Report instrument. The average for user classrooms was .87 questions per student. The average for nonuser classrooms was .64 (p = .01). At the sixth grade level, a significant difference in this skill was found in the spring on the Jim's Spacecraft instrument. The average for user classrooms was 2.38 questions; the average for nonuser classrooms was 2.10 (p = .01).

The second question on Form A required students to write their ideas about where they might go to get answers. At the fifth grade level, a significant difference between user and nonuser classrooms in this skill was found in the spring on the Jan's Report instrument. User classrooms averaged 1.38 ideas per student and nonuser classrooms averaged 1.18 (p = .03).

On Form B of each of the self-management instruments, the first question required students to demonstrate using a systematic approach to a task and also to demonstrate attention to detail on a project. While no significant differences in the first skill were found in the spring in either the fifth or the sixth grades, significant differences in the second skill were found in the spring at both grade levels. The results were as shown in Table 17. The direction of the significant difference changed as the instrument changed.

Table 17

Significant Differences in Attending to Detail at the Fifth and Sixth Grade Levels

Grade	Instrument	Average Acceptable Responses for User Classroom	Average Acceptable Responses for Nonuser Classroom	p =
5	Jan's Report	2.02	1.85	.001
5	Jim's Spacecraft	2.14	2.23	.001
6	Jan's Report	2.18	2.06	.001
6	Jim's Spacecraft	2.18	2.28	.001

The second question on Form B instruments required students to generate ideas about how to change a plan when the deadline is found to be sooner than expected. There were significant differences between user and nonuser classrooms in the spring in the average number of ideas produced by each student. The results were as shown in Table 18.

Table 18

Significant Differences in Generating Ideas at the Fifth and Sixth Grade Levels

Grade	Instrument	Average Number of Ideas for User Classroom	Average Number of Ideas for Nonuser Classroom	p =
5	Jan's Report	1.80	1.70	.001
5	Jim's Spacecraft	1.98	1.75	.001
6	Jan's Report	1.86	1.69	.001
6	Jim's Spacecraft	2.11	1.97	.001

Cross-Instrument Findings

A very important question regarding the impact of ThinkAbout concerns what influence factors other than the television broadcast itself had on student test performance. The following factors were investigated for their influence on CTBS test performance in classrooms where ThinkAbout was being used:

1. Teaching setting--whether the classroom is self-contained, non-traditional, or departmentalized (by subject)
2. Location of the school--large city, over 250,000 people; suburb of large city; middle-sized city, 50,000-250,000 people; suburb of middle-sized city; small city or town, less than 50,000 people; or rural area, not near a large or middle-sized city
3. Teacher rating of achievement level of class--above average, average, or below average
4. Teacher estimate of socioeconomic status of class--lower, lower middle, middle, upper middle, upper, or considerably mixed
5. Race of class--90% or more white, all others
6. Whether teacher attended a ThinkAbout workshop or in-service--yes or no
7. Whether teachers used instructional television in the past--yes or no
8. Average amount of time spent on discussion before viewing a ThinkAbout program
9. Average amount of time spent on discussion after viewing a ThinkAbout program
10. Average total amount of time spent on discussion (before and after) related to a ThinkAbout program
11. The number of ThinkAbout programs used in the classroom

12. The teacher's attitude toward the value of group discussions in class
13. The teacher's attitude toward individualizing instruction for each child
14. The teacher's attitude toward maintaining flexibility in the classroom
15. The teacher's perception of impact of ThinkAbout in each of 32 skill areas listed in the teacher's guide.

The results of these analyses are provided in Appendix L. They revealed one pattern: the number of programs shown in class often correlated highly with outcomes on CTBS and ThinkAbout tests. One must be careful, however, in attaching a causal interpretation to this finding. The results followed no clear-cut patterns for the other variables.

Use of ThinkAbout Questionnaire

This questionnaire (also referred to as end-of-year questionnaire) was administered in April to teachers in the testing study who used ThinkAbout in 1979-80. The purpose of the questionnaire was to collect data on the level of use teachers made of ThinkAbout, their reactions to the series, their perceptions of its impact on students, and some of their beliefs about teaching. Ninety-eight useable questionnaires were completed.

Section A of the questionnaire contained questions about classroom activity immediately before viewing a ThinkAbout program. Teachers responded to four questions as shown in Table 19.

Table 19

Teacher Responses to Questionnaire Section A

Immediately before viewing ThinkAbout how often do you discuss with your class:	Rarely	Some of the Time	Most of the Time	Almost Always
1. the main idea of program content?	21	37	19	17
2. specific important points of program content?	30	35	19	10
3. definitions of concepts related to program content?	35	35	15	8
4. examples of concepts related to program content?	42	26	17	7

The frequency distribution of the number of minutes spent on class discussions related to ThinkAbout program content immediately before viewing is shown in Table 20.

Table 20

Frequency Distribution of Time Spent on

ThinkAbout Discussions before Viewing

Number of Minutes	0	1	2	3	4	5	6	7	8	9	10	15	20	45
Number of Teachers:	15	0	5	14	0	33	0	8	1	4	12	4	1	1

When asked how they would characterize their class discussions immediately before viewing, the teachers responded as shown in Table 21.

Table 21

Teacher Descriptions of ThinkAbout Discussions before Viewing

Mostly Teacher Talking	Mostly Student Talking	Even—Both Teacher and Student Talking	Not Sure
56	0	25	4

The second section of the questionnaire asked exactly the same questions about class discussions but this time following ThinkAbout programs. Teachers responded to these questions as shown in Table 22.

Table 22

Teacher Responses to Questionnaire Section B

	Rarely	Some of the Time	Most of the Time	Almost Always
Immediately after viewing ThinkAbout how often do you discuss with your class:				
1. the main idea of program content?	1	18	36	39
2. specific important points of program content?	3	22	34	35
3. definitions of concepts related to program content?	6	24	33	29
4. examples of concepts related to program content?	5	24	34	28

The distribution of time spent on discussions related to ThinkAbout content immediately after viewing a program is shown in Table 23.

Table 23

Frequency Distribution of Time Spent on

ThinkAbout Discussions after Viewing

	Number of Minutes															
	0	1	2	3	4	5	6	7	8	9	10	11 - 15	16 - 20	21 - 25	30	45
Number of Teachers:	2	0	1	3	0	17	0	8	2	3	23	27	8	2	1	1

In characterizing their class discussions of ThinkAbout programs immediately after viewing, teachers responded as shown in Table 24.

Table 24

Teacher Descriptions of ThinkAbout Discussions after Viewing

Mostly Teacher Talking	Mostly Student Talking	Even—Both Teacher and Student Talking	Not Sure
3	22	63	2

There were thus substantial differences indicated in classroom discussions before and after ThinkAbout programs.

Section C of the questionnaire contained 31 statements about ThinkAbout to which teachers were asked to respond. The statements and the number of responses to each are found in Table 25 (p. 90). The teachers participating in the testing study who used ThinkAbout indicated positive attitudes towards the series.

In Section D, each teacher was asked to list two major strengths and two major weaknesses of ThinkAbout. Then they were asked for their suggestions for improving ThinkAbout. A list of the major strengths and the number of times each was mentioned are found in Table 26 (p. 92). Table 27 (p. 93) lists the major weaknesses and the number of times each was mentioned. Suggestions that the teachers had for improving ThinkAbout included those shown in Table 28 (p. 94).

When asked if they viewed the ThinkAbout programs in the order provided in the teacher's guide, 8 responded no and 52 responded yes. A substantial number of teachers (38) did not respond to the question.

Section F of the questionnaire asked teachers to indicate their perception of the degree to which students had learned certain skills from the ThinkAbout series. The teachers were asked about 32 skills and they responded as shown in Table 29 (p. 95). They generally responded that ThinkAbout had a moderate impact on their students in every skill listed.

In Section E of the questionnaire, teachers were asked to indicate which ThinkAbout programs they used in their classroom during 1979-80. Their responses are shown in Table 30 (p. 97). Teachers were completing this questionnaire at the end of the year, but several of the programs at the end of the series remained to be broadcast. This could account for the large number of non-responses beginning with Program 53.

Table 25

Teacher Responses to Questionnaire Section C

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagre
1. I find *ThinkAbout* programs interesting.	66	27	1	0	0
2. I bring up ideas from *ThinkAbout* programs when teaching other subjects.	34	49	10	0	0
3. I would encourage other teachers to use *ThinkAbout*.	60	29	4	1	0
4. *ThinkAbout* shows great possibilities for stimulating my creativity.	29	43	20	1	0
5. When teachers use *ThinkAbout*, they lose some of their importance in the classroom setting.	1	3	8	40	42
6. The personal relationship between student and teacher is enhanced when *ThinkAbout* is used.	9	40	37	8	0
7. The development of new *ThinkAbout* programs at other grade levels would be a waste of time.	0	1	15	46	32
8. *ThinkAbout* programs are uniformly high in quality.	25	64	3	2	0
9. Material is clearly presented in *ThinkAbout* programs.	21	29	1	1	0
10. *ThinkAbout* reinforces material taught in other lessons.	24	60	7	0	0
11. *ThinkAbout* motivates students' interest in a subject(s).	12	55	24	3	0
12. *ThinkAbout* programs arouse discussion in my class(es).	23	55	15	1	0
13. Use of *ThinkAbout* facilitates individualization of instruction.	1	30	53	10	0
14. *ThinkAbout* programs present material not commonly available in existing curriculum material.	19	53	15	5	1
15. *ThinkAbout* presents material not covered by other instructional television programs.	22	52	18	1	0
16. *ThinkAbout* programs help students develop problem-solving skills.	34	48	11	0	0
17. *ThinkAbout* programs help students to express themselves effectively.	10	53	30	0	0

(continued)

Table 25 (continued)

	Strongly Agree	Agree	Neither Agree nor Disagree	Disagree	Strongly Disagre
18. *ThinkAbout* programs help students manage their own learning.	6	45	40	3	0
19. *ThinkAbout* programs help students to reason systematically.	10	64	19	1	0
20. *ThinkAbout* programs help students to think flexibly.	11	62	21	0	0
21. *ThinkAbout* extends the range of experiences available to students.	28	57	8	1	0
22. *ThinkAbout* programs have relevance for day to day living experiences of students.	34	51	9	0	0
23. Situations depicted in *ThinkAbout* programs are realistic.	36	41	11	3	1
24. My students are interested in *ThinkAbout* programs.	60	31	2	1	0
25. My students feel that *ThinkAbout* programs are usually realistic.	37	43	12	2	0
26. My students can identify with characters in *ThinkAbout* programs.	42	36	10	4	1
27. My students bring up ideas from *ThinkAbout* programs when studying other subjects.	23	35	29	5	0
28. My students would like to use *ThinkAbout* in class again next year.	40	35	13	1	0
29. Reaction of my students to *ThinkAbout* is highly favorable.	50	31	9	2	1
30. My students are bored with the *ThinkAbout* series.	1	1	8	29	52
31. The *ThinkAbout* teacher's guide is a useful resource.	23	51	10	2	2

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Table 26

Strengths of *ThinkAbout* Identified in Questionnaire Section D

		Number of Teachers Responding This Way
1.	Students' benefit, helps students, etc.	1
2.	Student interest, students like it, students enjoy it, keeps students' attention, etc.	13
3.	Motivates students.	5
4.	Stimulates class discussion, class participation, weekly discussions, etc.	2
5.	Helps "kids" in problem-solving skills, "kids" learn how to think out problems, "kids" learn new ways to look at problems, teaches "kids" how to develop and choose among alternatives, etc. (Kids and students are used interchangeably.)	5
6.	Improves students' research skills, reports (oral, book, and written), papers, etc.	1
7.	Aids students' creativity, helps "kids" think in new ways, exposes "kids" to new thoughts, new ideas.	7
8.	Self-concept boost for students, good for "kids"' ego, self-esteem, self-concept, etc., gives "kids" positive attitude.	4
9.	Good for "kids"' interpersonal skills, teaches cooperation, how to get along with others, how to handle personal problems, personal relationships.	2
10.	Program content is good.	8
11.	Programs are high quality, programs are well-made, programs are informative, well organized.	5
12.	Programs are flexible, programs respond to different feelings and situations, programs may be used for many different things, in different ways, etc.	1
13.	Programs do not stereotype, programs use minorities, etc.	3
14.	Programs are relevant to class, relevant to students, relevant to students' problems. Brings everyday experiences into classwork, etc. Programs have good examples. Realistic situations.	29
15.	Programs are better than textbooks.	1
16.	Programs are excellent. It is fantastic.	1
17.	Beneficial to teacher, helps teacher, good tool for teaching.	1
18.	Gives teacher(s) time for other activities.	1
19.	Students are able to relate *ThinkAbout* to everyday situations (outside classroom).	5
20.	Programs fit well with many other subjects.	1
21.	Covers wide range of ideas, concepts, etc. Presents important concepts.	2
22.	Other	20

Table 27

Weaknesses of ThinkAbout Identified in Questionnaire Section D

		Number of Teachers Responding This Way
1.	Students are bored by programs, students don't like them, students aren't interested.	1
2.	Programs are poorly made, low-quality, unorganized, etc.	1
3.	Programs do not fit well with class, weren't interesting to the class, etc.	1
4.	Programs are unrealistic, not relevant, acting was unrealistic.	13
5.	Programs do not develop ideas or concepts enough. Not specific enough, etc. Programs are open-ended. The end is left "hanging in the air."	5
6.	Programs too difficult for students, above students' level.	6
7.	Programs too simple, easy, for students; programs too low for students' level.	2
8.	Not helpful to teacher; poor tool for teaching; not beneficial to teacher.	1
9.	Teacher does not have enough time to show time, not enough time to preview shows; not enough aides to free time for teachers; interfered with other activities.	1
10.	Programs too urban-based for rural students.	4
11.	No teacher's manual; poor teacher's manual. Teacher's manual incomplete.	3
12.	Need accompanying materials, need better additional materials, etc.	1
13.	No flexibility in scheduling, scheduling problems, timing problems.	6
14.	Too much repetition; too many reruns.	2
15.	Programs were not aired as scheduled, programs were not broadcast as scheduled.	1
16.	Programs were too short.	2
17.	Other	9
18.	No negative experiences recalled (different than no response).	13
19.	Programs not available.	2

Table 28

Improvements Suggested on Questionnaire Section D

		Number of Teachers Responding This Way
1.	New teacher's guide. More and better accompanying materials, worksheets, dittos, etc.	4
2.	Eliminate certain programs, cut out the poor programs.	1
3.	Follow-up series, make new shows. Extend to junior high level.	2
4.	Add more variety in the situations and the actors. Have rural settings. Have kids of varied ages.	2
5.	Make it easier to understand, simplify vocabulary.	2
6.	Have summing-up at end. Cover main points of show briefly and conversely.	2
7.	Make shows more realistic.	4
8.	Make shows longer. Extend a concept through more than one show. Needs more depth.	14
9.	Add more discussion ideas and questions. Encourage more participation by audience.	2
10.	Other	14

Table 29

Teacher Responses to Questionnaire Section F

Skill	Very Low 1	2	3	4	Very High 5
1. Find alternatives when solving problems.	3	9	46	25	6
2. Understand the importance of having alternatives.	0	5	34	34	15
3. In using the skills of estimating and approximating, both individually and together.	0	18	45	19	3
4. In deciding when to estimate and when to approximate.	4	22	43	11	5
5. Understand that giving and getting meaning requires attention to how senders and receivers use and interpret information.	1	11	41	27	7
6. Determine information needs.	0	13	46	26	3
7. Select appropriate sources of information.	0	11	34	35	7
8. Use various strategies to collect information.	0	11	36	35	6
9. Classify objects and information on the basis of similar characteristics.	0	10	43	28	5
10. Realize that stereotyping may result from inflexibly classifying people.	1	11	34	30	11
11. Recognize commonly occurring patterns.	1	11	27	41	6
12. Understand that patterns can be useful in solving problems.	0	10	30	39	8
13. Draw conclusions based on evidence.	1	7	36	34	8
14. Avoid acting before checking their conclusions.	4	22	33	25	3
15. Sequence ideas or activities.	3	10	43	25	5
16. Plan a schedule.	2	17	32	32	5
17. See the importance of using criteria when making decisions or judgments.	2	11	40	29	4
18. Find appropriate criteria.	3	16	42	22	3
19. Reassess criteria when necessary.	4	20	46	13	3
20. Put information into forms that are useful for their purposes.	2	13	48	20	3
21. Change the form of information when a problem requires it.	2	18	48	16	2
22. Get more meaning from a fixed amount of information.	2	13	44	26	2
23. Find reliable information sources.	1	10	35	35	5

(continued)

Table 29 (continued)

		Very Low				Very High
		1	2	3	4	5
24.	Discriminate between important and unimportant information.	3	17	34	29	4
25.	Determine how much information is enough for a purpose.	4	22	32	25	2
26.	Recognize common techniques for persuasion.	1	17	30	34	5
27.	Learn about someone else's viewpoint.	0	5	34	35	11
28.	Make more effective formal and informal presentations.	2	15	38	29	3
29.	Use language more flexibly.	1	18	44	18	5
30.	Decide how much time to give to thinking about (or trying to solve) a problem.	3	25	36	17	6
31.	Realize that risk taking is part of problem solving, and that one must decide upon how much risk one wants to accept when preparing a plan to solve a problem.	3	23	37	17	6
32.	Accept failures in problem solving, learn from then, and persist.	2	21	36	21	5

Table 30

Teacher Responses to Questionnaire Section E

	No	Yes	Not Sure
Cluster 1: Finding Alternatives			
1. Why Bother?	12	68	3
2. Brainstorming	7	78	1
3. Blockbusting	7	74	4
Tip Program			
4. You Can Remember!	7	67	7
Cluster 2: Estimating and Approximating			
5. Estimating	10	80	2
6. Approximating	9	81	2
7. Using Estimating and Approximating	9	77	6
Tip Program			
8. Find Your Guide	12	58	12
Cluster 3: Giving and Getting Meaning			
9. What's The Meaning?	8	76	6
10. Meaning Is More Than Words	9	79	2
11. Remember The Audience!	12	70	9
12. But What Does It Mean?	10	72	7
13. The Bigger Picture	9	76	5
14. Where Are You Coming From?	9	76	5
Challenge Program			
15. Make a Present for the Future	8	66	13
Cluster 4: Collecting Information			
16. What Do I Know?	6	82	4
17. Where Should I Go?	6	80	5
18. What Should I Do?	7	79	5
Tip Program			
19. Ways To Remember	7	72	10
Cluster 5: Classifying			
20. Classifying Objects	4	84	2
21. Classifying Information	2	85	3
22. Stereotyping People	4	81	5

(continued)

Table 30 (continued)

	No	Yes	Not Sure
Tip Program			
23. There Are Many Ways To Go	5	72	10
Cluster 6: Finding Patterns			
24. People Patterns	6	78	5
25. Communication Patterns	3	82	4
26. Cultural Patterns	5	76	8
27. Nature's Patterns	9	71	8
Challenge Program			
28. Search for the Unknown	7	71	9
Cluster 7: Generalizing			
29. Drawing Conclusions	3	85	1
30. Checking Conclusions	4	84	1
Tip Program			
31. Practice for Success	13	60	13
Cluster 8: Sequencing and Scheduling			
32. One Step at a Time	7	79	4
33. Plan Ahead	6	80	1
Tip Program			
34. Calm Your Jitters	9	65	8
Cluster 9: Using Criteria			
35. What Are They?	7	74	4
36. Where Do You Find Them?	8	73	4
37. How Do You Change Them?	10	68	7
Challenge Program			
38. Design a Language	13	54	10
Cluster 10: Reshaping Information			
39. Symbols	7	71	3
40. More Than You Think	12	63	4
41. Summarizing	9	67	3
42. Maps and Models	14	55	9
Tip Program			
43. Get Ahead with Goals	15	56	2

(continued)

Table 30 (continued)

	No	Yes	Not Sure
Cluster 11: Judging Information			
44. Should I Believe It?	11	69	1
45. What's Important?	7	70	3
46. What's Enough?	11	65	4
47. Point of View	12	65	3
48. Persuasive Techniques	13	62	3
Tip Program			
49. Make a Deal with Yourself	13	54	4
Cluster 12: Communicating Effectively			
50. Styles of Communication	15	55	3
51. Planning a Presentation	13	59	2
52. Making a Presentation	12	54	4
53. Making Your Point	17	41	3
54. Making It Come Alive	20	34	3
Challenge Program			
55. Make Something New	16	33	2
Cluster Program 13: Solving Problems			
56. One Thing Leads to Another	14	29	3
57. A Matter of Time	15	25	3
58. There's Always a Risk	17	16	2
59. Hanging in There	16	15	2
Challenge Program			
60. Plan a City of the Future	16	12	2

IV. FINDINGS--THE SURVEYS

Survey Design and Sampling Procedures

This section describes the research techniques and sampling procedures used in the four surveys of teachers in the United States and Canada.

Mailed questionnaires were used in all four surveys because of their many advantages over interviews. They are cheaper and less time-consuming than interviews for researchers and respondents, especially when wide territorial coverage is necessary. One major drawback to questionnaires, however, is the potential for a low rate of return. Several steps were taken in this study to ensure a high rate. One was to keep each questionnaire as short as possible, another was to send follow-up letters and blank questionnaires to non-respondents, and yet another was to use stamped return envelopes.

A set of four surveys provided distinct advantages over a single survey. Four surveys conducted over seven months enabled the researchers to match the implementation and utilization phases of the ThinkAbout series with corresponding questions. For example, the first survey emphasized the availability of TV equipment, the prior use of ITV series, the adoption of the ThinkAbout series, and training activities available to the teachers. The second survey emphasized viewing patterns, the use of ThinkAbout, and experiences with ThinkAbout. The third was oriented toward measuring the attitudes and opinions of the teachers about the series. The fourth survey dealt with the perceived impact of ThinkAbout and other summary opinions.

A number of respondents received more than one questionnaire to allow for longitudinal comparisons.

A good sampling frame and probability sampling procedures ensure the generalizability of a survey. Some problems were encountered in achieving both. It is prohibitively costly to develop and use a nationwide list of fifth and sixth grade teachers to conduct a study of this type. Furthermore, such a list would not be very useful even if available because a large number of fifth and sixth grade teachers might not be using ThinkAbout. It was impossible to construct a sampling frame of all ThinkAbout users in the U.S. and Canada because in the first year of the series most states and provinces could not identify ThinkAbout users.

Thus another search strategy was adopted to collect names of ThinkAbout users. The services of the Agency for Instructional Television (AIT), the producer of the series, were secured for the search. An extensive solicitation by AIT resulted in four different categories of lists:

1. Lists of known users of ThinkAbout.
2. Lists of probable users, consisting of teachers who had requested preliminary teacher guides, attended workshops, or otherwise indicated interest in the series.
3. Lists of names identified through contact people. The contact person was usually a school principal or a media specialist who was expected to know the names of program users in his or her school. These people also identified others to act as liaisons between the researchers and the users. They distributed questionnaires sent to them and sometimes collected and returned the questionnaires.
4. Lists of TV broadcasting stations. A very small sample

was drawn from this group since the frame consisted of only 214 members and no responses were received from them.

It is impossible to construct a unified sampling frame from such a heterogeneous set of categories, so samples were drawn separately from each. The sampling frames, however (especially in category 1), kept getting larger as more names were received. Hence, the initial goal of 1,000 questionnaires in the first survey was exceeded.

Although our sampling did not strictly constitute a probability sample, probability techniques were used as far as possible. A systematic sample was used in category 1 (actual program users), which comprised 2,554 names. In category 2, it was difficult to use any simplified system. For example, one state sent a list of most of the teachers in the state--more than 1,450 names--since the preliminary teacher's guide had been sent to all of them. Another state sent more than 350 names. The overrepresentations in these two states precluded a systematic sample for the entire category. So a systematic sample was drawn from all states except those two. A proportionately smaller sample was drawn from them. There was a total of 3,872 names in this category.

Names were also selected systematically from category 3. Each person sampled was asked to contact one ThinkAbout user and give him or her the questionnaire. Category 3 comprised 1,231 people. (In the first survey, they were requested to send a list of additional names of ThinkAbout users or probable users, which enabled us to construct a larger, unified sampling frame for the second, third, and fourth surveys.) In the first survey, a systematic sample was also drawn from category 4, which comprised 121 people. Since no responses were received from them, this category was not used in the other surveys.

In some cases it was necessary to obtain permission from a school district or a state to collect names or to conduct the study. However, the procedure was fairly informal, and permission was usually granted without delay. In almost all cases, the brevity of the questionnaire, its noncontroversial nature, and the consortium membership of the states were instrumental in gaining cooperation.

Individuals in the first two categories received the questionnaires directly. Others received them through contact people. Follow-up letters were sent to all non-respondents in about the fourth week after the initial mailing in each of the four surveys. Different types of letters were sent to users and to the contact group (category 3).

The sample sizes for the four surveys were 1,207, 1,078, 1,023, and 1,006 respectively. Response rates varied by category and by survey. The total response rate for all the surveys was about 67%; it ranged from a low of 53% in the second survey to a high of 77% in the third. The returns for the first and fourth surveys were 76% and 61% respectively. (See Table 31.)

Table 31

Survey Response Rates*

	Surveys			
	1	2	3	4
Sample size	1207	1078	1023	1006
Response rate	76%	53%	77%	61%
Users	731 (80%)	452 (79%)	489 (62%)	460 (75%)
Nonusers	187 (20%)	122 (21%)	296 (38%)	156 (25%)
Total returns	918 (100%)	574 (100%)	785 (100%)	616 (100%)

*Adjusted percentages in parentheses

The total numbers of user responses in the four surveys were 731, 452, 489, and 460 respectively. The total numbers of nonuser responses were 187, 122, 296, and 156 respectively. Each follow-up mailing resulted in additional responses. These were considered as a different set from the original, or first-wave, responses. Since we lack definitive information about the actual number of series users, it is hard to assess these return rates. Probably a large proportion of those who did not respond were nonusers, but it is hard to confirm this. The high rate of return from probable users was quite unexpected.[1]

A large number of states participated in this study, and the sample sizes for the states in the four surveys are presented in Table 32. The testing sites--Iowa, Mississippi, Oregon, and Pennsylvania--are listed first, followed by other states and provinces in the U.S. and Canada. The sample sizes generally reflect the size of the sampling frame and not the population of the state, and the variations in the proportion of users and nonusers reflect the quality of the lists of names used in the surveys.

To do a longitudinal study and to check for changes in opinions and attitudes, samples for the second, third, and fourth surveys included respondents from earlier surveys who had indicated they used ThinkAbout. In the fourth survey, 80% of the respondents had previously responded to one or more surveys. In the third survey, about

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[1] Though the sampling frame consisted of 7,778 elements, it must be remembered that this was the total of all possible users, including the contact group. It does not reflect the number of actual ThinkAbout users.

Table 32

Survey Returns by State*

State	Survey 1		Survey 2		Survey 3		Survey 4	
	Users	Nonusers	Users	Nonusers	Users	Nonusers	Users	Nonusers
Iowa	109 (15)	24 (12.8)	63 (13.9)	6 (5.0)	48 (9.9)	16 (5.8)	53 (11.6)	7 (4.8)
Mississippi	45 (6.2)	5 (2.7)	24 (5.3)	2 (1.7)	17 (3.5)	1 (0.4)	19 (4.2)	3 (2.0)
Oregon	10 (1.4)	8 (4.3)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Pennsylvania	12 (1.6)	16 (8.6)	0 (0)	0 (0)	2 (0.4)	3 (1.1)	1 (0.2)	3 (2.0)
Alabama	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.4)	0 (0)
Alaska	5 (0.7)	3 (1.6)	0 (0)	0 (0)	0 (0)	1 (0.4)	1 (0.2)	2 (1.4)
Arizona	2 (0.3)	0 (0)	6 (1.3)	1 (0.8)	4 (0.8)	0 (0)	1 (0.2)	0 (0)
Arkansas	6 (0.8)	3 (1.6)	0 (0)	0 (0)	1 (0.2)	3 (1.1)	3 (0.7)	5 (3.4)
California	36 (4.9)	16 (8.6)	20 (4.4)	1 (0.8)	27 (5.5)	29 (10.6)	9 (2.0)	8 (5.4)
Connecticut	2 (0.3)	0 (0)	1 (0.2)	2 (1.7)	1 (0.2)	1 (0.4)	1 (0.2)	1 (0.7)
Florida	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.4)	0 (0)	0 (0)
Georgia	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (1.4)
Illinois	16 (2.2)	1 (0.5)	23 (5.1)	12 (9.9)	6 (1.2)	4 (1.5)	15 (3.3)	7 (4.8)
Indiana	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.4)	9 (3.3)
Kentucky	14 (1.9)	0 (0)	12 (2.7)	2 (1.7)	5 (1.0)	2 (0.7)	11 (2.4)	2 (0.7)
Maine	3 (0.4)	0 (0)	7 (1.5)	4 (3.3)	6 (1.3)	4 (2.7)	16 (3.3)	2 (0.7)
Maryland	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.4)	0 (0)	0 (0)
Massachusetts	7 (1.0)	3 (1.6)	0 (0)	0 (0)	1 (0.2)	1 (0.4)	0 (0)	0 (0)
Michigan	5 (0.7)	3 (1.6)	1 (0.2)	1 (0.8)	0 (0)	2 (0.7)	2 (0.4)	0 (0)

(continued)

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*Adjusted percentages in parentheses

Table 32 (continued)

State	Users	Nonusers	Users	Nonusers	Users	Nonusers	Users	Nonusers
Minnesota	1 (0.1)	0 (0)	4 (0.9)	3 (2.5)	3 (0.6)	1 (0.4)	3 (0.7)	1 (0.7)
Missouri	12 (1.6)	1 (0.5)	4 (0.9)	2 (1.7)	15 (3.1)	7 (2.6)	4 (0.9)	0 (0)
Montana	1 (0.1)	1 (0.5)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
Nebraska	0 (0)	0 (0)	8 (1.8)	1 (0.8)	1 (0.2)	0 (0)	6 (1.3)	1 (0.7)
Nevada	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	2 (0.7)	0 (0)	0 (0)
New Hampshire	1 (0.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
New Mexico	1 (0.1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)
New York	23 (3.2)	6 (3.2)	2 (0.4)	1 (0.8)	7 (1.4)	6 (2.2)	0 (0)	2 (1.4)
North Carolina	20 (2.7)	3 (1.6)	37 (8.2)	11 (9.1)	47 (9.7)	28 (10.2)	45 (9.8)	21 (14.3)
North Dakota	11 (1.5)	9 (4.8)	6 (1.3)	4 (3.3)	13 (2.7)	14 (5.1)	2 (0.4)	2 (1.4)
Ohio	53 (7.3)	24 (12.8)	24 (5.3)	10 (8.3)	97 (19.9)	36 (13.1)	37 (8.1)	14 (9.5)
Oklahoma	3 (0.4)	3 (1.6)	5 (1.1)	7 (5.8)	0 (0)	1 (0.4)	4 (0.9)	8 (5.4)
Puerto Rico	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (0.4)	0 (0)	0 (0)
Rhode Island	36 (4.9)	4 (2.1)	0 (0)	0 (0)	0 (0)	0 (0)	31 (6.8)	1 (0.7)
South Carolina	49 (6.7)	11 (5.9)	42 (9.3)	4 (3.3)	68 (14.0)	25 (9.1)	30 (6.6)	13 (8.8)
South Dakota	5 (0.7)	2 (1.1)	4 (0.9)	4 (3.3)	7 (1.4)	11 (4.0)	12 (2.6)	5 (3.4)
Tennessee	35 (4.8)	5 (2.7)	29 (6.4)	8 (6.6)	13 (2.7)	8 (2.9)	18 (3.9)	1 (0.6)
Utah	3 (0.4)	3 (1.6)	4 (0.9)	5 (4.1)	4 (0.8)	8 (2.9)	5 (1.1)	9 (6.1)
Vermont	35 (4.8)	14 (7.5)	20 (4.4)	5 (4.1)	18 (3.7)	2 (0.7)	12 (2.6)	6 (4.1)
Virginia	18 (2.5)	7 (3.7)	22 (4.9)	1 (0.8)	11 (2.3)	4 (1.5)	15 (3.3)	3 (2.0)
Washington	2 (0.3)	0 (0)	6 (1.3)	11 (9.1)	13 (2.7)	33 (12.0)	4 (0.9)	4 (2.7)
West Virginia	19 (2.6)	3 (1.6)	29 (6.4)	6 (5.0)	4 (0.8)	4 (1.5)	22 (4.8)	3 (2.0)

(continued)

Table 32 (continued)

State	Users	Nonusers	Users	Nonusers	Users	Nonusers	Users	Nonusers
Wisconsin	49 (6.7)	5 (2.7)	37 (8.2)	4 (3.3)	34 (7.0)	7 (2.6)	39 (7.9)	9 (6.1)
Alberta	62 (8.5)	3 (1.6)	0 (0)	0 (0)	0 (0)	0 (0)	39 (8.5)	1 (0.7)
Ontario	0 (0)	0 (0)	0 (0)	1 (0.8)	0 (0)	0 (0)	0 (0)	0 (0)
Saskatchewan	6 (0.8)	0 (0)	12 (2.7)	2 (1.7)	2 (0.4)	0 (0)	8 (1.8)	0 (0)
No response	2 (*)	* (*)	0 (0)	1 (*)	2 (*)	22 (*)	3 (*)	9 (*)
Total	731 (100.0)	187 (100.0)	452 (100.0)	122 (100.0)	489 (100.0)	296 (100.0)	460 (100.0)	156 (100.0)
Total sample	1207		1078		1023		1006	

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*Missing

half (49%) of the respondents were repeaters. In the second survey, 31% of the respondents were repeaters.

Summary

To sum up the design, the survey reached 34 states and two Canadian provinces. Separate samples were drawn, and systematic sampling techniques were used, in each of four categories:

1. Known users of ThinkAbout
2. Probable users of ThinkAbout
3. Contact personnel: media specialists, principals, etc.
4. Broadcasting stations (used only in the first survey).

There was a great disparity in size among the four samples. Given the nature of the sampling frame, only an approximation to probability sampling could be achieved.

The total sample size for the four surveys was 4,314. Some of the teachers were included more than once. A large proportion of the sample in the fourth survey consisted of repeaters from previous surveys. There were 2,132 responses from ThinkAbout users and 761 from nonusers--a total of 2,893. This 67% return rate was achieved through the use of stamped return envelopes, cover letters, and follow-up letters.

Background Information and Demographics

This section provides information about background and demographic issues such as location of school and years of teaching experience. Questions about most of these were included in all four surveys; the tables indicate which surveys.

Location of school: Small towns was the modal (most frequent) category for all teachers who were using ThinkAbout with their classes.

Table 33

Location of School*

	Survey 1		Survey 2		Survey 3		Survey 4	
	User	Nonuser	User	Nonuser	User	Nonuser	User	Nonuser
Urban	105 (15)	40 (22.7)	85 (19.2)	26 (27.7)	82 (16.9)	55 (23.4)	83 (18.4)	21 (19.3)
Suburban	180 (25.7)	41 (23.3)	99 (22.4)	24 (25.5)	126 (26.0)	73 (31.1)	100 (22.2)	24 (22.0)
Small town	296 (42.3)	62 (35.2)	167 (37.8)	23 (24.5)	189 (39.0)	68 (28.9)	175 (38.8)	35 (32.1)
Rural	104 (14.9)	32 (18.2)	83 (18.8)	18 (19.1)	85 (17.6)	37 (15.7)	89 (19.7)	27 (24.8)
Other/combination	15 (2.2)	1 (0.6)	8 (1.8)	3 (3.2)	2 (0.4)	2 (0.8)	4 (0.8)	2 (1.8)
No response	31 (—)	11 (—)	10 (—)	28 (—)	5 (—)	61 (—)	9 (—)	47 (—)
Totals	731 (100.0)	187 (100.0)	452 (100.0)	122 (100.0)	489 (100.0)	296 (100.0)	460 (100.0)	156 (100.0)

Table 34

Years of Full-Time Teaching Experience*

Years Teaching Experience	Survey 1		Survey 2		Survey 3		Survey 4	
	User	Nonuser	User	Nonuser	User	Nonuser	User	Nonuser
1-5	137 (19.2)	37 (21)	86 (19.1)	13 (13.8)	88 (18.2)	41 (17.8)	85 (18.6)	16 (15.4)
6-10	215 (23.2)	50 (28.2)	139 (31.0)	30 (32.0)	147 (30.3)	72 (31.4)	131 (28.6)	33 (31.5)
11-15	150 (21.1)	43 (24.2)	88 (30.8)	18 (19.1)	99 (20.0)	55 (24.0)	97 (21.2)	22 (21.0)
16-20	98 (13.8)	22 (12.5)	69 (15.4)	16 (17.1)	73 (15.1)	4 (9.2)	68 (14.8)	15 (14.3)
21-25	44 (6.1)	12 (6.8)	27 (5.9)	8 (8.5)	33 (6.8)	21 (9.2)	28 (6.1)	6 (5.8)
26-30	42 (5.9)	8 (4.6)	19 (4.2)	5 (5.4)	28 (5.6)	7 (3.0)	54 (5.6)	8 (7.7)
31 or more	27 (3.6)	5 (3.0)	21 (4.5)	4 (4.3)	16 (3.2)	12 (5.2)	23 (5.0)	5 (4.9)
No response	1 (—)	10 (—)	3 (—)	28 (—)	5 (—)	67 (—)	2 (—)	51 (—)
Totals	731 (100.0)	187 (100.0)	452 (100.0)	122 (100.0)	489 (100.0)	296 (100.0)	460 (100.0)	156 (100.0)

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*Adjusted percentages in parentheses

This was true in all four surveys. Suburban schools was the next most frequent category. The proportions of schools from urban and from rural areas were fairly close. (See Table 33, p. 110.)

Years of full-time teaching experience: Six to ten years of teaching was the modal category in all four surveys, followed by 11 to 15 years. Prior teaching experience varied from 1 to 31 years or more. (See Table 34, p. 110.)

Setting in which the teachers taught: A majority of the teachers worked in self-contained classrooms. A departmental setting was the second most common type. Non-traditional setting and a combination of settings were other categories identified. The settings for users of ThinkAbout were similar to those for nonusers. (See Table 35.)

Table 35

Setting in which Teachers Teach*

	Survey 1		Survey 2	
	User	Nonuser	User	Nonuser
Self-contained	389 (55.0)	89 (50.6)	222 (49.3)	58 (62.4)
Nontraditional	42 (5.9)	16 (9.1)	25 (5.6)	3 (3.2)
Departmental	174 (24.6)	39 (22.2)	118 (26.2)	13 (14.0)
Other	84 (11.9)	26 (14.8)	63 (14.0)	13 (14.0)
Combination	17 (2.4)	6 (3.4)	22 (4.9)	6 (6.5)
No response	25 (—)	11 (—)	2 (—)	29 (—)
Totals	731 (100.0)	187 (100.0)	452 (100.0)	122 (100.0)

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*Adjusted percentages in parentheses

Grades taught: A majority of the users (79%) and nonusers (55%) were fifth and sixth grade teachers, though the range of grades taught extended from pre-K to 11th grade. (See Table 36.)

Table 36

Grades Taught (Survey 1)

	PreK-1	2	2	4	5	6	7	8	9-11
Users									
N	34	14	20	77	429	427	43	33	11
%	3.1	1.3	1.8	7.1	39.4	39.2	3.9	3	1
Nonusers									
N	30	17	18	31	91	80	22	17	7
%	9.6	5.4	5.8	9.9	29.1	25.6	7.0	5.4	2.2

Teaching assignment: Among the 257 teachers who identified the specific subjects they taught (with up to three responses each), 86 (34%) mentioned language arts and 19% mentioned mathematics, followed by social science (12%) and science (7%). The "other" category received an 18% response.

Summary

A modal profile of the ThinkAbout user shows a teacher from a small town or suburban area, with 6 to 10 years of teaching experience, who works in a self-contained setting with fifth or sixth grade students. Of course, such a profile should be interpreted with caution, since there is considerable variation within each characteristic. Nevertheless, there was an overall consistency across the four surveys, and there seemed to be no major demographic differences between ThinkAbout users and nonusers.

Use of Instructional Television

Availability of TV equipment: In the first survey, a very large majority of the respondents (99% of the users of ThinkAbout and 89% of the nonusers) indicated that they had television and/or videotape equipment available for use with their classes.

Location of viewing equipment: When asked in the second survey where the television viewing equipment was located in their schools, 214 (48%) of the respondents reported that the equipment was in their own or a nearby classroom and 83 (19%) reported that it was in a media room. A combination of locations was reported by 56 (13%) of the respondents.

Availability of equipment in classrooms: The great majority of ThinkAbout users in surveys 1 and 2 rated the availability of classroom television equipment as good (82% in survey 1 and 73% in survey 2). Less than 5% of the respondents in either survey rated the availability poor. The remainder (16% in survey 1 and 22% in survey 2) reported that it was neither poor nor good.

Instructional television series: In the first survey, most of the respondents reported using ITV the previous year. Of the ThinkAbout users who viewed ITV in 1978-79, about 69% had viewed one to three series; an additional 15% had viewed four series. While 31% of the ThinkAbout users who had viewed ITV the previous year had viewed four or more series, only 12% of the nonusers had viewed as much.

During the 1979-80 school year, according to the responses to the first survey, about 3/4 of the teachers used more than one television series. More than 70% of both ThinkAbout users and nonusers viewed one to three series. And the distribution seems evenly spread across one, two, and three series. Thus, while the teachers who elected to use ThinkAbout this year tended to use more ITV last year, they did not differ from nonusers of ThinkAbout in the number of ITV series used this year.

Time spent viewing ITV: The modal category for users of *ThinkAbout* was 46 to 60 minutes, followed very closely by 16 to 30 minutes. About 2/3 (65.8%) of this group viewed ITV for one hour or less each week. For the nonusers of *ThinkAbout* who viewed ITV, the modal category was 16 to 30 minutes, followed very closely by 46 to 60 minutes. For this group, more than 3/4 (78.9%) viewed ITV for one hour or less. Several teachers—users and nonusers—noted that they viewed ITV for four or more hours per week.

When the viewing of *ThinkAbout* was excluded, the modal category was 16 to 30 minutes per week (29%). More than 80% of the teachers viewed ITV series other than *ThinkAbout* for one hour or less per week, about 53% for 30 minutes or less.

Training: A minority of the teachers (43% of the *ThinkAbout* users and 32% of the nonusers) indicated that they had had training in the use of specific ITV series in the last three years. Responding to the first survey, 57% of the users indicated that they had not had any training. Of the 294 users who had had training, 235 (80%) indicated that they had attended workshops. (See Table 37.)

Table 37

Training in the Use of ITV

in the Past Three Years

	Users		Nonusers	
	N	%	N	%
No	410	56	75	40
Yes	304	42	58	31
Workshop	235	80	39	74
College	20	7	11	21
Other	39	13	3	6
No response	17	2	54	29

Summary

The use of instructional television presupposes availability of and access to equipment. It also implies training in and familiarity with ITV. Among the *ThinkAbout* users, there was almost universal agreement about the availability of TV equipment. Almost half the respondents had equipment located in their classrooms. For teachers who used ITV, using it up to one hour per week was common. Less than half of the teachers stated that they had had training in the use of specific ITV series, and such training was usually provided through workshops.

Decision To Use and Preparation for Use of ThinkAbout

We can assume that all teachers who use *ThinkAbout* have seen it. More than 1/3 (36%) of the nonusers stated that they had seen it also, and more than half (52%) of the nonusers indicated that *ThinkAbout* was available for their use. In the first survey, many questions were asked about the promotion and in-service preparation for the introduction of the series.

Promotional material: A very large proportion of the users of *ThinkAbout* (91%) had received promotional material. Among the nonusers, only 44% had received it. Of those who had received it, a large majority of the users and nonusers indicated that it gave them a good idea of the series (97% and 89% respectively).

Orientation meetings and workshops: Thirty-nine percent of the *ThinkAbout* users had attended an orientation meeting for *ThinkAbout*. Only 15% of the nonusers had done so. But the number decreases for workshop attendance. About 1/4 (24%) of the *ThinkAbout* users had attended a workshop on the series and 10% of the nonusers had also.

The workshops ranged from 30 minutes to more than 6 hours. The modal category was 61 to 120 minutes (26%). More than 3/4 of the workshops lasted four hours or less. (See Table 38.)

Table 38

Time Duration of Workshop (Summary 1)

Minutes	N	%
≤ 60	35	19.0
61-120	48	26.1
121-180	35	19.1
181-240	24	13.1
241-300	17	9.2
301-360	17	9.3
360+	7	3.1
Total	182	100.0

A majority of the teachers found the workshops useful. This was true of both users (83%) and nonusers (71%) of ThinkAbout. Of the teachers who identified the organization conducting the workshops, 33 reported a state-level organization and 16 a local one.

Introduction of ThinkAbout: Responses to questions in three of the four surveys indicate that most of the teachers introduced the ThinkAbout series in September 1979. October was the month next most commonly cited. Very few people--less than 10%--began using the series after November.

Teachers were asked in the first survey if they would use the entire ThinkAbout series or only segments of it. This question was included because it was felt that plans to use or not to use the series could be an indirect way of finding out teachers' opinions of it, even though many other factors (for example, scheduling problems) impinge on the decision whether to use a series. A majority of those who responded (62%) indicated that they planned to use the entire series. An additional 28% indicated that they planned to use most of it. The rest opted for selected programs (8%) or selected clusters (2%).

In the second survey, we asked teachers about their plans for using ThinkAbout during the rest of the academic year. Fifty-three percent (221) of them indicated that they planned to use all the remaining programs and 36% (149) indicated that they planned to use most of them. Four respondents indicated that they were not planning to use any more ThinkAbout programs and 43 were going to be selective in their use.

On the second survey, three teachers indicated reasons why they discontinued using ThinkAbout--one because the series was ineffective, one because of scheduling problems, one because of other problems.

Curtailing other activities for ThinkAbout: The introduction of new materials into classroom schedules already crammed with activities often requires that other activities be eliminated or limited. When teachers were asked in the second survey if they had to curtail other activities to make time for ThinkAbout, 185 (43%) indicated that they did not and 94 (22%) indicated that they did so with regularity. Seventy-five respondents (18%) said they rarely had to curtail other activities. About the same number (74, or 17%) said they had to curtail other activities frequently.

When teachers curtailed an academic subject, language arts was the one curtailed most often (78 respondents cited it). Social studies (36), math (28), and science (19) were curtailed next most often. Fifty-nine teachers pointed to physical education and other nonacademic activities being reduced as a result of ThinkAbout.

Circumstances that would lead to discontinuing the use of ThinkAbout: More than a third of the teachers did not answer this question. But among those who did, scheduling problems was the category with the most responses (48%). Change in program quality or content, the unavailability of programs, equipment problems, and reduced student interest were mentioned as other possible reasons. Forty-two respondents (19%) indicated that they would not discontinue using ThinkAbout. (See Table 39.)

Table 39

Circumstances that Would Cause Teacher

To Discontinue Use of ThinkAbout

Circumstances	N	%
Less student interest	14	5.6
Change in program quality or content	28	11.2
Scheduling problems	121	48.2
Program not available	22	8.8
Equipment problems	19	7.6
Other	47	18.7
None	42	—
No response	159	—
Total	452	100.0

Encouragement or discouragement of the adoption of ThinkAbout: In the first survey, nine categories of participants in the curriculum decision-making process were identified. Teachers were asked to assess the role of each in influencing their adoption of ThinkAbout. Students were perceived as the group providing the maximum level of encouragement, followed by instructional TV representatives and building principals. The central administration, other teachers, and media specialists were perceived as very similar to

Table 40

Support for the Adoption of ThinkAbout*

	State Dept. Education	Central Admin.	Bldg. Principal	Instruct. TV Rep.	Parents	School Board	Other Teachers	Media Specialists	Students	Other
1. Strongly encourage use	90 (14.1)	102 (15.7)	162 (24.3)	226 (35.6)	18 (2.8)	30 (4.7)	131 (19.9)	149 (23.0)	390 (58.7)	14 (17.5)
2. Encourage use but leave to discretion of teacher	132 (20.7)	214 (32.9)	266 (39.9)	137 (21.6)	31 (5.4)	59 (9.3)	185 (28.1)	146 (23.5)	115 (17.3)	8 (10.0)
3. Neither encourage nor discourage use	81 (12.7)	136 (20.9)	161 (24.1)	70 (11.0)	241 (38.1)	199 (31.4)	226 (34.3)	121 (19.5)	101 (15.2)	9 (11.3)
4. Discourage use but leave to discretion of teacher	0 (0)	1 (0.2)	3 (0.4)	0 (0)	1 (0.2)	1 (0.2)	1 (0.2)	1 (0.2)	2 (0.3)	1 (1.3)
5. Strongly discourage use	0 (0)	0 (0)	2 (0.3)	0 (0)	0 (0)	1 (0.2)	1 (0.2)	1 (0.2)	3 (0.5)	0 (0)
6. Don't know	336 (52.6)	198 (30.4)	73 (10.9)	202 (31.8)	339 (53.6)	343 (54.2)	114 (17.3)	202 (32.6)	53 (8.0)	48 (6.0)
Total	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)	731 (100)
No response	92	80	64	96	98	98	73	111	67	651

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*Adjusted percentages in parentheses

one another in the level of encouragement they provided. The State Department of Education, followed by the school board, was perceived as providing the next highest level of encouragement. Parents and others were perceived as providing the least encouragement. (See Table 40, p. 119.)

A plurality of the teachers (37%) stated that they made the decision to adopt the series by themselves. Eighty-two respondents cited building principals as most influential. A large number of teachers said the adoption of ThinkAbout was due to a combination of influences. (See Table 41.)

Table 41

Most Influential Individual, Group, or Agency

In the Decision To Adopt ThinkAbout

	N	%
State	4	0.6
Central administration	49	7.1
Building principal	82	11.9
Media specialist	36	5.2
Self (teacher)	253	36.7
Other teachers	37	5.4
ITV representative	28	4.1
Combination/other	183	20.5
Don't know	18	2.6
No response	41	Missing
Total	731	100.0

Summary

Even a majority of nonusers of ThinkAbout had seen ThinkAbout programs, and the series was available for use by about half of them. Most of the users and almost half of the nonusers indicated that they had received promotional material and that it had given them a good idea of the series. Many of the teachers had attended orientation meetings or workshops. The workshops ranged from 30 minutes to six hours and were viewed as useful.

ThinkAbout programs were introduced by most teachers in September 1979. Very few teachers began the series after October. Some said that they did not have to curtail other classroom activities for ThinkAbout; others said that they had to curtail activities to some degree. Scheduling problems were the major reason teachers cited for discontinuing the use of ThinkAbout. Students were identified as providing the maximum amount of support for the adoption of ThinkAbout. Next, in order of the support they provided, were principals and instructional TV representatives. Most of the teachers stated that the decision to adopt the series was their own or due to a combination of influences.

Using ThinkAbout

Even though this was the first year of ThinkAbout's availability, 2/3 of the respondents (66%) indicated that they had had adequate time for preparation. But 18% of them had not. The remainder were not sure.

As mentioned above, the teachers responding to the surveys taught grades ranging from pre-kindergarten through 11th grade. They reported using ThinkAbout in grades K through 10. As expected, fifth and sixth grades were mentioned most often (by 90% of the respondents), followed by fourth and seventh grades (about 7% to 8%, varying with the survey). Grades below the fourth or above the seventh constituted less than 3% of the total number of responses.

Because some teachers indicated in the first survey that they used ThinkAbout in more than one grade and more than one class, questions about the total number of grades in which ThinkAbout was used were included in succeeding surveys. Most of the teachers used it only in one grade (80% to 82%), and the number of teachers who used it in two ranged from 15% to 17% in the three surveys. Occasionally a teacher reported using ThinkAbout in five, six, or even eight grades.

A supplementary question about the total number of classes in which ThinkAbout was used was included in each of the four surveys. Again, a majority of the teachers (58% to 66%) indicated that they used ThinkAbout with one class. The range of responses for teachers who used it with two classes was 17% to 23%. In three of the four surveys, a very few teachers mentioned using ThinkAbout with as many as nine classes.

Class size: Teachers were asked the number of students to whom they showed ThinkAbout regularly. The modal response to this question was 21 to 25 students in three surveys and 26 to 30 in the other. These two categories covered from 43% to 50% of the responses in the four surveys. About 2/3 of the teachers reported 35 or fewer students watching ThinkAbout. The smallest classes consisted of one to five students, and the largest one exceeded 400. (See Table 42.)

Viewing in the classroom: Broadcast television was the most common viewing format (60% to 69%) and videotape/film/cassette the next most common (23% to 31%). Some teachers (7% to 11%) indicated that they had a choice of both. (See Table 43.)

In the second survey, teachers were asked what format they preferred for viewing ThinkAbout in class. A plurality of the teachers indicated that they preferred broadcasting (181, or 42%).

Table 42

Number of Students Viewing ThinkAbout

Number of Students	Survey 1		Survey 2		Survey 3		Survey 4	
	N	%	N	%	N	%	N	%
1-5	2	.3	5	1.1	4	.8	0	0
6-10	6	.8	5	1.1	5	1.0	2	.4
11-15	23	3.2	16	3.6	15	3.1	15	3.3
16-20	65	9.0	39	8.7	32	6.6	42	9.3
21-25	192	26.5	104	23.3	95	19.6	111	24.4
26-30	173	23.9	86	19.3	123	25.4	100	22.0
31-35	49	6.8	34	7.6	71	14.7	39	8.6
36-40	21	2.9	12	2.7	8	1.7	12	2.6
41-45	16	2.2	12	2.7	13	2.7	8	1.7
46-50	21	2.9	16	3.6	21	4.3	17	3.7
51-55	25	3.4	17	3.8	15	3.1	15	3.3
56-60	25	3.4	25	5.6	23	4.8	29	6.4
61-65	15	2.1	11	2.5				
66-70	16	2.2	11	2.5	6	1.2	9	2.0
71-75	14	1.9	8	1.8	8	1.7	6	1.3
76-400	62	8.6	45	10.1	45	9.3	49	10.8
No response	6	—	6	—	5	—	6	--
Total	731	100	452	100	489	100	460	100

Table 43

Viewing in the Classroom

Viewing Format	Survey 1		Survey 2		Survey 3		Survey 4	
	N	%	N	%	N	%	N	%
Broadcasting	439	60.7	308	68.9	321	69.3	278	61.6
Videocassette/film	225	31.1	105	23.5	111	24.0	123	27.3
Both	59	8.2	34	7.6	31	6.7	50	11.1
No response	8	—	5	—	26	—	9	—
Totals	731	100.0	452	100.0	489	100.0	460	100.0

A large number of teachers (146, or 34%) preferred having both broadcasting and videotape/film/cassette available. A quarter of the teachers preferred videotape/film/cassette. Almost all the respondents who used videotape/film/cassette (141, or 97%) stated that they had their own viewing schedule; only a few indicated that they had not.

Selecting ThinkAbout programs: Three hundred forty-eight, or 80%, of the responding teachers stated that they always had the option to select programs for classroom use. The rest either had no choice (10%) or could exercise the option only rarely (1%) or occasionally (9%).

Respondents who always had the option to select programs were asked to indicate the basis on which they made their selections. The two most common responses were the appropriateness (123, or 29%) and the relevance (84, or 20%) of the programs. Student interest was also frequently used as a basis for selection. (A more detailed breakdown of responses is provided in Table 44.)

Table 44

Basis for Selecting ThinkAbout Programs

Basis for Selection	N	%
Students' interest	51	12.0
Teacher's interest	31	7.3
Grade level appropriateness, applicability to curriculum	123	29.0
Relevance to class	84	19.8
Schedule, time availability	41	9.7
Quality of programs, benefit to class	34	8.0
Previews of programs	11	2.6
Other	49	11.6
No response	480	—
Total	904	100.0

Because several respondents indicated more than one basis for selection, a second response was coded. The frequencies in Table 44 reflect both responses.

In the third survey, 46% (22) of the teachers reported that they could make up a program they had missed. Thirty-nine percent could not and 15% could sometimes do so.

Time spent teaching with ThinkAbout: In the discussion of data on the use of instructional television (pp. 112ff.), it was noted that about 15% of the teachers using ThinkAbout also used at least one or two other television series. These teachers spent from 10 to 60 minutes each week watching instructional television, but when ThinkAbout was scheduled, more than half viewed a half hour or less.

Teaching with television, however, is more than merely viewing the programs with the class. In most classrooms, there are discussions before and after the programs and occasional assignments pertaining to them. In several of the surveys, teachers reported in various ways on the amount of time they spent each week on lessons associated with television programs.

On the second survey, teachers reported that the amount of time used each week on instructional television lessons (excluding ThinkAbout lessons) ranged from 10 to 780 minutes (the latter in one case only). Nineteen percent of the teachers using instructional television indicated that they spent 16 to 30 minutes each week on lessons connected with it (excluding ThinkAbout lessons). Eighteen percent spent 46 to 60 minutes and 12% (38) spent 106 to 120 minutes. Twenty-five percent spent 40 minutes or less. Approximately 50% spent 70 minutes or less; 75% spent 140 minutes or less. (The data

Table 45

Time Spent on Instructional Television

(Viewing, Pre- and Post-Viewing Discussions and Activities)

Time in Minutes	Time Spent without ThinkAbout (2nd Survey)		Time Spent on ThinkAbout (1st Survey)		Time Spent on ThinkAbout (2nd Survey)		Time Spent on ThinkAbout (3rd Survey)	
	N	%	N	%	N	%	N	%
1- 15	9	2.7	12	1.6	1	0.2	2	0.4
16- 30	61	18.8	135	19.2	42	9.6	64	13.7
31- 45	25	7.7	139	19.6	46	10.7	64	13.7
46- 60	57	17.6	256	36.0	89	20.5	111	23.8
61- 75	14	4.3	32	4.5	9	2.1	16	3.4
76- 90	28	8.6	75	10.5	44	10.1	49	10.5
91-105	5	1.5	7	1.0	4	0.9	9	1.9
106-120	38	11.7	33	4.7	55	12.7	40	8.6
121-135	2	0.6	1	0.1	6	1.4	8	1.7
136-150	15	4.5	8	1.1	23	5.3	19	4.1
151-165	5	1.5	1	0.1	8	1.9	2	0.4
166-180	21	6.5	2	0.3	34	7.8	21	4.5
181-195	1	0.3	0	0	3	0.7	2	0.4
196-210	5	1.5	1	0.1	8	1.8	10	2.1
211-225	0	0	0	0	1	0.2	1	0.2
226-240	14	4.3	5	0.7	32	7.4	22	4.7
240 or more	24	7.3	4	0.5	29	6.5	27	5.8
No response	128	—	20	—	18	—	22	—
Totals	452	100.0	731	100.0	452	100.0	489	100.0

are presented in collapsed form in Table 45, p. 126.)

In addition to questions about other instructional television series, several questions were asked on the first three surveys about time spent in class on activities surrounding ThinkAbout.

A plurality of teachers in all three surveys indicated that the total time spent on ThinkAbout viewing, class assignments, and discussions before and after programs was 46 to 60 minutes. In the first survey, 75% of the respondents stated that they spent 60 minutes or less per week on these activities. In the second survey, 75% spent 151 to 165 minutes. In the third survey, the 75% mark was reached in the 106-to-120-minute category. (See Table 45.)

Immediately before viewing ThinkAbout, more than half of the teachers (56%) spent up to five minutes in discussion related to the program. This was the modal category. Thirty percent spent 10 minutes. The range of time spent in discussion was from 1 to 40 minutes, 5, 10, and 15 minutes being the amounts of time most commonly reported. The overall mean time of discussion was 7½ minutes, and the median was approximately five minutes. (See Table 46.)

Table 46

Time Spent in Discussion

before and after Viewing

Minutes in Discussion	Before Viewing		After Viewing	
	N	%	N	%
1- 5	224	56.3	75	16.3
6-10	115	29.9	188	40.8
11-15	47	11.8	119	25.8
16-20	—	—	44	9.5
16-40	8	2.0	—	—
21-60	—	—	35	7.6
No response	91	—	28	—
Totals	489	100.0	489	100.0

After the program, 41% of the teachers reported spending 10 minutes or less in discussion related to the program. This was the modal category. Sixteen percent spent five minutes or less in discussion, and 26% spent 11 to 15 minutes. The range of time spent in discussion was from one minute to one hour, 5, 10, 15, and 20 minutes being the amounts of time most commonly reported. The overall mean time for discussion was 12½ minutes, the mean approximately 10 minutes.

Broadcast schedule: In survey 1, most of the respondents (96%) agreed that the programs were usually or always broadcast on the scheduled days. Twenty-six respondents (4%) indicated that the programs were rarely broadcast on those days. A similar proportion of respondents (96%) indicated that the programs usually or always started at the scheduled times. Twenty-six respondents (4%) indicated otherwise. A large majority (570, or 98%) indicated that the programs were usually or always broadcast in the scheduled sequence. Two percent indicated otherwise. A majority of the classes viewed Think-About twice a week (65% and 66% in surveys 2 and 3 respectively). Many teachers used it only once a week (23% and 31%).

Viewing schedules: Questions on viewing schedules were included in surveys 1 and 2. Fridays were the least popular days for viewing. Monday mornings and Tuesday afternoon were the most popular. The next most popular were Wednesday mornings and Thursday afternoons. (See Table 47.)

Table 47

Viewing Schedule

	Actual (Survey 1)				Actual (Survey 2)				Preferred			
	a.m.		p.m.		a.m.		p.m.		a.m.		p.m.	
	N	%	N	%	N	%	N	%	N	%	N	%
Monday	190	82	41	18	149	78	42	22	83	59	58	41
Tuesday	103	31	225	69	65	32	139	68	49	39	78	61
Wednesday	175	79	47	21	133	71	54	29	68	53	61	47
Thursday	114	36	202	64	78	38	129	62	48	37	82	63
Friday	69	56	54	44	33	50	33	50	33	41	47	59

When it came to the optimum time for viewing, there was no single time preferred by most of the respondents. Generally, afternoons were preferred to mornings. Similarly, Monday and Wednesday mornings were preferred over other mornings. In the mornings 10:00 a.m. was preferred more often than other time periods, and in the afternoons 1:00.

When asked if the present schedule was convenient, 160 (38%) of the respondents felt that it was very convenient and 146 (34%) felt that it was somewhat so. Fourteen percent felt that it was very inconvenient and 13% felt that it was somewhat so.

Approximately 3/4 of the viewers (76%) said that they had rarely experienced technical difficulties in viewing ThinkAbout, but 1/4 (24%) stated that they had experienced difficulties more often.

In surveys 1 and 2, most of the teachers (85% and 88%) preferred that the viewing frequency continue at the then-current rate. Other teachers preferred fewer (4% and 7%) or more (11% and 5%) programs per week.

Number of programs used: When asked what proportion of the programs aired was viewed in the classroom, a large number of the respondents (191, or 46%) stated that they had viewed most of them.

One hundred fifty-four respondents (37%) reported viewing them all. Fifty-five (16%) reported viewing some.

Surveys 2, 3, and 4 asked the number of programs viewed. Since the surveys were sequential, the average number of programs increased with each succeeding survey. In January 60% of the teachers reported viewing more than 20 programs. In March 52% reported viewing more than 30, and in May 64% reported viewing more than 40. By this time, about 30% had reported viewing all or almost all of the programs, and another 27% had viewed fewer than 30.

A majority of teachers (419, or 87%) made no change, once they started, in the frequency of their viewing of ThinkAbout programs. Only 9% viewed fewer programs than originally planned, and 4% viewed more.

Summary

This section covered: 1) preparation for ThinkAbout, 2) grades using ThinkAbout, 3) the size of classes viewing ThinkAbout, 4) viewing format, 5) time and schedule for viewing ThinkAbout programs, and 6) the number of programs viewed.

Preparation for ThinkAbout: A majority of the teachers felt that they had had enough time for preparation for the series, although this was its first year.

Grades using ThinkAbout: A wide range of grades (from kindergarten to 10th grade) was identified as using ThinkAbout. Of course the fifth and sixth grades were the two most common. Most teachers used ThinkAbout in one grade and one classroom.

The size of classes viewing ThinkAbout: As one would expect, class sizes of 21 to 25 and 26 to 30 were most common; the upper limit, however, exceeded 350.

Viewing format: Broadcasting was the most common and also the most preferred format for viewing ThinkAbout. Many teachers indicated a preference for the flexibility of a combination of broadcast and videotape/film/cassette. Most of the teachers could select which programs they viewed. The grade-level appropriateness and the relevance of the programs were the two major criteria by which teachers selected programs.

Time spent viewing and teaching ThinkAbout: On the average, classes viewing ThinkAbout spent an hour per week viewing the programs and discussing them before and after viewing. On the average, less than eight minutes was spent in discussion before viewing, and a little more than 12 minutes was spent in discussion after viewing. (The ThinkAbout programs are 15 minutes long.) Though there were disruptions in some states, most teachers stated that the programs were usually broadcast on the scheduled days, at the scheduled times, in the scheduled sequence. Most classes viewed the programs twice a week.

There were no optimal times for viewing the programs, but Tuesday and Thursday afternoons and Monday and Wednesday mornings were preferred. Although many teachers felt that the schedule was somewhat inconvenient, a majority felt that it was convenient or somewhat convenient. Most teachers preferred to continue viewing the programs at the same rate.

Number of programs viewed: As one would expect, the number of programs viewed by students increased with each survey. At least 1/4 of the respondents in the fourth survey indicated that their students had viewed all or almost all of the 60 programs.

ThinkAbout Teacher Guides and Materials

At the time of the first survey, most of the respondents (657, or 91%) indicated that they had received a copy of the preliminary teacher's guide. On the second survey, 88% (389) indicated that they had. In addition, 55% reported having a copy of the new, permanent guide. By the third survey, 82% of the teachers reported having this guide, and by the fourth survey, only about 10% did not have either. (See Table 48.)

Table 48

Teacher Guide Availability*

Survey	Preliminary	New	Both	None
1	91			9
2	88	55		12
3		82		18
4	22	24	45	10

*Data in percentages

In the second survey, teachers were asked how they obtained copies of the preliminary teacher's guide. The most frequent response (33%) was: through the school media center. Another 20% received it through the school. Thus, more than half of the teachers received guides at the building level. (See Table 49.)

Table 49

How Preliminary Teacher's Guide Was Obtained

Method	N	%
Through direct mail	56	15.3
Through school	72	19.7
Through school district	30	8.2
Through school media center	120	32.9
From another teacher	7	1.9
At a workshop	31	8.5
Other	49	13.4
No response	87	—
Total	452	100.0

Teacher's opinions of the guide: Sixty-four percent of the teachers rated the guide good, and 23% excellent. Twelve percent rated it a mixture of good and poor, and fewer than 2% rated it poor or very poor.

Approximately 14% (70) of the teachers responding to the third survey made suggestions for improving the teacher's guide. Of those who responded, 22 (31%) wanted worksheets added. Ten percent wanted the guide simplified, while another 10% wanted more detail.

A set of four questions on the fourth survey were designed to gather information about the types of working materials preferred to supplement the teacher's guide. An additional question dealt with the availability of such material.

Importance of workbooks: While 50% of the teachers indicated that *ThinkAbout* workbooks would be essential (8%) or very useful (42%), this was the supplement to the series least preferred. Twenty-seven percent of the respondents considered workbooks unnecessary. (See Table 50.)

Table 50

Value of Supplementary Materials

	Workbooks		Duplicate Masters		Learning Games		Teaching Posters	
	N	%	N	%	N	%	N	%
Essential	33	8.0	64	14.7	49	11.6	52	12.4
Very useful	174	42.2	235	54.1	174	41.1	178	42.3
Useful	92	22.3	94	21.7	138	32.6	138	32.8
Not necessary	113	27.4	41	9.4	62	14.7	52	12.6
No response	48	—	26	—	37	—	39	—
Totals	460	100.0	460	100.0	460	100.0	460	100.0

Importance of duplicating masters: This was the supplement most preferred; 69% of the teachers rated duplicating masters essential or very useful. Only 9% of the respondents indicated that they were unnecessary. (See Table 50.)

Importance of learning games: About 53% of the teachers rated learning games essential or very useful. Fifteen percent of the respondents indicated that they were unnecessary. (See Table 50.)

Importance of teaching posters: As to posters, 55% of the respondents considered them essential or very useful. Thirteen percent indicated that they were unnecessary. (See Table 50.)

If supplementary materials such as duplicating masters and workbooks were to be created, how should they treat the ThinkAbout concepts--in the context of everyday situations, in a subject-matter context, or a combination of both? The teachers indicated a preference for the everyday situations (47%); 21% preferred subject matter, especially language arts, alone or in combination with social studies. Thirty percent wanted materials that combined both contexts.

Given this general desire for supplementary ThinkAbout materials, it is interesting to note the effort already exerted by teachers. By the second survey, 81 (19%) were in the process of developing their own materials or activities to supplement the programs, and 55 (13%) had already developed them.

Summary

Most of the teachers had a copy of the preliminary teacher's guide, a copy of the new teacher's guide, or both. A very few users had neither. Most of the teachers thought the guides good or excellent. They were acquired through the schools, most often from media centers or elsewhere within the school building.

Workbooks, learning games, teaching posters, and especially duplicating masters were endorsed by the teachers as useful or very useful. Some teachers had already started developing their own materials.

ThinkAbout and School Curriculum

This section deals with the subject-matter status of ThinkAbout. The purposes of the survey questions were to ascertain whether ThinkAbout was part of an established curriculum or a separate subject in itself, and to gather teacher opinion data on the subject matter with which ThinkAbout could be integrated.

Integration with school curriculum: At the time of the first survey, a majority of the teachers (377, or 54%) were using ThinkAbout as a separate subject. The rest (325, or 46%) indicated that it was integrated with other school subjects; in a few cases it was integrated with more than one. A rank ordering of major curriculum subjects with which it was integrated includes language arts (38%), social studies (26%), mathematics (14%), science (9%), and study skills (8%).

In the second survey in January, when the 452 respondents were asked if ThinkAbout was integrated with their established curriculum, 331 (81%) indicated that it was. Seventy-seven (19%) indicated that it was a separate subject in itself. The respondents who stated that ThinkAbout was part of the established curriculum were then asked to identify the curriculum area(s) with which it was integrated. The respondents were allowed more than one response, and the 345 who answered the question averaged 1.6 responses each. Study skills received the most emphasis: 64% reported using ThinkAbout for that subject, and about 60% of those used it for other subjects as well. Language arts followed study skills; 56% used ThinkAbout for that subject, about 1/3 for language arts only and 2/3 for other subjects also. Thirteen percent of the teachers used ThinkAbout for mathematics, and very few of those for math alone. Eleven percent mentioned other subjects, often in combination with one of the three already mentioned, but many also identified social studies and science as curriculum areas with which ThinkAbout could be integrated. (See Table 51.)

Table 51

Curriculum Areas with Which ThinkAbout Is Integrated

	N	%
Study skills	220	63.8
Alone	86	39.1
With other subjects	134	60.9
Language arts	192	55.7
Alone	66	34.4
With other subjects	126	65.6
Math	45	13.0
Alone	5	11
With other subjects	40	89
Other	39	11.3

When these teachers were asked if ThinkAbout was used as a substitute for or a supplement to traditional curriculum material, a large majority (340, or 78%) considered it a supplement. Forty-nine (11%) considered it neither a substitute nor a supplement, and 37 (9%) considered it both an alternative and a supplement. Only eight teachers (2%) considered ThinkAbout an alternative to or replacement for traditional curriculum materials.

In addition to being asked how they were presently using ThinkAbout in various curriculum areas, teachers were also asked to rate how well ThinkAbout could be integrated with the three major skill areas discussed in the teacher's guide—language arts, mathematics, and study skills. A rating of 0 meant no possible integration, and a rating of 10 meant the highest possible integration. Study skills had a mean score of 8.2 and a median score of 9.0, which indicated a belief that ThinkAbout and study skills had a very high level of possible integration. Of the 348 respondents who rated this area, 148 (42%) gave it a 10; this was the modal category. Language arts skills had the next highest set of scores (mean 7.5 and median 8.0). Of the 343 respondents who rated this area, 91 (26%) gave it a 10. Mathematical skills had the lowest scores, a mean of 5.5 and a median of 5.3. Of the 296 respondents who rated this area, 66 (22%) gave it a 5, which was the modal category, and 54 (18%) gave it an 8. (See Table 52.)

While ThinkAbout did fit into a curriculum niche for many teachers, the interdisciplinary nature of the series suggested that references to it might occur in other subjects. There were 294 teachers who indicated that references to ThinkAbout had occurred in other subjects during the week previous to completing the second survey. Of this total, 14% indicated one reference, 34% indicated two, and 21% indicated three. Fewer than 1/3 of the teachers reported more than three references outside the curriculum focus they had identified for the series.

Of the 452 ThinkAbout users responding to the second survey, 176 (58%) indicated that ThinkAbout fit adequately into the total curriculum for fifth graders and 126 (41%) felt that it fit very adequately. Only four respondents (1%) thought that it fit poorly

Table 52

Potential for ThinkAbout Curriculum Integration[*]

Integration Rating		Language Arts N = 343	Mathematics N = 296	Study Skills N = 348
No possible integration	0	0.1	5.1	0.9
	1	1.7	1.4	4.0
	2	5.5	5.4	1.4
	3	2.6	11.5	1.4
	4	2.0	8.8	1.1
	5	7.9	22.3	4.9
	6	6.7	8.1	3.2
	7	8.5	9.5	5.5
	8	28.0	18.2	20.1
	9	9.9	2.7	14.9
Highest possible integration	10	26.5	7.1	42.5
Mean scores		7.5	5.5	8.2
Median scores		8.0	5.3	9.0

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[*] Data in percentages

or very poorly. ThinkAbout was also felt to fit nicely into the total curriculum of sixth graders. It was felt to fit adequately by 154 (50%) of the respondents and to fit very adequately by another 153 (50%).

Summary

ThinkAbout was a part of the established curriculum in many cases, though it was treated as a separate subject in a majority of them. Study skills curriculum was cited most often as the area of integration, followed closely by language arts. In almost all instances, ThinkAbout was used as a supplement rather than an alternative to traditional curriculum materials. A majority of the teachers felt that ThinkAbout fit well into the fifth and sixth grade curricula. Study skills, according to the teachers, had the potential for a very high level of integration. Language arts had the next greatest potential, followed at a great distance by mathematics. Social studies and science were also mentioned as possible areas of high integration. In addition, references to ThinkAbout came up in other subjects.

Teacher Assessment of ThinkAbout

A series of attitude items were presented to teachers on the third and fourth surveys. The five-choice Likert-type items dealt with teacher attitudes and opinions about the series and its utility in the classroom and teachers' perceptions of student reactions. Also included are several items on the perceived impact of the series. All the data are presented in Table 53. In addition to percentages, scale scores were calculated for each (strongly agree = 5, strongly

Table 53

Teacher Attitudes and Opinions about ThinkAbout*

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Scale Score
When teachers use ThinkAbout they lose some of their importance in the classroom setting (N = 481).	0.6 (3)	1.5 (7)	7.7 (37)	41.4 (199)	48.9 (235)	1.64
The personal relationship between students and teacher is enhanced when ThinkAbout is used (N = 483).	14.7 (71)	55.9 (270)	27.1 (131)	1.4 (7)	0.8 (4)	3.82
ThinkAbout shows great possibilities for stimulating creativity (N = 483).	18.4 (88)	65.6 (314)	12.7 (61)	2.9 (14)	0.4 (2)	3.99
Children watch television at home; they don't need to watch more in school (N = 481).	0.8 (4)	1.9 (9)	7.3 (35)	50.1 (241)	39.9 (192)	1.74
I would encourage other teachers to use ThinkAbout (N = 480).	49.4 (237)	46.7 (224)	2.9 (14)	0.4 (2)	0.6 (3)	4.44
My students find the ThinkAbout programs interesting (N = 483).	53.2 (257)	44.9 (217)	1.2 (6)	0.4 (2)	0.2 (1)	4.51
I find some of the ideas in ThinkAbout useful in my own activities (N = 482).	28.8 (139)	64.3 (310)	6.2 (30)	0.4 (2)	0.2 (1)	4.21

(continued)

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*Number of teachers in parentheses

Table 53 (continued)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Scale Score
ThinkAbout programs have relevance for day to day living experiences of my students (N = 482).	41.5 (200)	57.1 (275)	0.8 (4)	0.4 (2)	0.2 (1)	4.39
I bring up ideas from ThinkAbout programs when teaching other subjects (N = 482).	23.4 (113)	64.1 (309)	10.8 (52)	1.5 (7)	0.2 (1)	4.09
My students bring up ideas from ThinkAbout when studying other subjects (N = 479).	12.5 (60)	62.0 (297)	20.5 (98)	4.8 (23)	0.2 (1)	3.82
ThinkAbout programs present complex ideas better than I can do in 15 minutes (N = 483).	33.5 (162)	50.1 (242)	13.7 (66)	2.3 (11)	0.4 (2)	4.14
ThinkAbout programs present more ideas than I can deal with in one class period (N = 483).	15.9 (77)	38.5 (186)	25.5 (123)	18.8 (91)	1.2 (6)	3.49
ThinkAbout programs arouse discussion in my class(es) (N = 482).	17.8 (86)	70.3 (339)	9.3 (45)	2.3 (11)	0.2 (1)	4.03
The ThinkAbout series is suitable for students below the 5th grade (N = 478).	4.0 (19)	25.3 (121)	24.7 (142)	36.4 (174)	4.6 (22)	2.88
The ThinkAbout series is suitable for students above the 6th grade (N = 481).	14.3 (69)	59.9 (285)	17.0 (82)	7.9 (38)	0.8 (4)	3.79
Material is clearly presented in ThinkAbout programs (N = 482).	29.5 (142)	66.4 (320)	3.7 (18)	0.4 (2)	--	4.25

(continued)

Table 53 (continued)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Scale Score
Material is usually presented step by step in the ThinkAbout programs (N = 482).	29.0 (140)	65.1 (314)	4.8 (23)	1.0 (5)	--	4.22
Presentation of major ideas in ThinkAbout programs is detracted by attention to incidental details (N = 480).	1.7 (8)	5.8 (28)	22.1 (106)	59.8 (287)	10.6 (51)	2.28
Characters depicted in ThinkAbout programs are similar to 5th and 6th graders (N = 482).	22.8 (110)	68.5 (330)	4.4 (21)	4.4 (21)	--	4.10
ThinkAbout programs present material not commonly available in existing curriculum material (N = 478).	18.8 (90)	60.5 (289)	12.1 (58)	7.9 (38)	0.6 (3)	3.89
Situations depicted in ThinkAbout programs are realistic (N = 480).	26.3 (126)	67.9 (326)	4.2 (20)	1.7 (8)	--	4.19
My students can identify with characters in ThinkAbout programs (N = 476).	24.2 (115)	68.9 (328)	5.5 (26)	1.5 (7)	--	4.16
My students are bored with the ThinkAbout series (N = 481).	0.8 (4)	4.2 (20)	4.4 (21)	49.1 (236)	41.6 (200)	1.74
My students feel that ThinkAbout programs are usually realistic (N = 473).	12.9 (61)	73.8 (349)	9.3 (44)	2.3 (11)	1.7 (8)	3.94
Most of my students participate in discussions of ThinkAbout programs (N = 478).	11.1 (53)	64.9 (334)	13.2 (63)	5.9 (28)	--	3.86

(continued)

Table 53 (continued)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Scale Score
My students feel that ThinkAbout material is too hard to comprehend (N = 480).	0.2 (1)	1.0 (5)	6.3 (30)	69.4 (333)	23.1 (111)	1.86
My students feel that ThinkAbout programs talk down to them (N = 479).	0.6 (3)	2.9 (14)	6.3 (30)	62.0 (287)	28.2 (135)	1.86
My students are interested in ThinkAbout programs (N = 480).	30.6 (147)	65.4 (314)	2.3 (11)	1.0 (5)	0.6 (3)	4.24
Students feel the ThinkAbout series is dumb (N = 478).	0.2 (1)	1.3 (6)	2.5 (12)	50.2 (240)	45.8 (219)	1.60
My students are generally more interested in the ThinkAbout series now than they were in the beginning of the series (N = 475).	9.7 (46)	40.6 (193)	41.1 (195)	7.8 (37)	0.8 (4)	3.51
The reactions of my students to ThinkAbout is highly favorable (N = 478).	37.9 (181)	56.9 (272)	4.8 (23)	0.4 (2)	--	4.32
Students find the ThinkAbout programs interesting (N = 450).	69.8 (314)	29.3 (132)	0.9 (4)	--	--	4.69
The ThinkAbout series has high overall educational effectiveness (N = 450).	45.3 (204)	48.0 (216)	6.7 (30)	--	--	4.39
ThinkAbout programs stimulate effective follow-up lessons (N = 448).	24.6 (110)	56.7 (254)	17.9 (80)	0.9 (4)	--	4.05

(continued)

Table 53 (continued)

	Strongly Agree	Agree	Neither	Disagree	Strongly Disagree	Scale Score
Other teachers should be encouraged to use *ThinkAbout* (N = 448).	48.7 (218)	41.7 (187)	9.4 (42)	--	0.2 (1)	4.39
ThinkAbout is a useful learning device (N = 449).	50.8 (228)	46.3 (208)	2.7 (12)	0.2 (1)	--	4.48
ThinkAbout is a useful teaching device (N = 445).	47.0 (209)	48.1 (214)	4.9 (22)	--	--	4.42

disagree = 1). While the data are generally positive, there are differences among items and clusters of items.

When teachers use ThinkAbout *they lose some of their importance*: A large majority of respondents (90%) did not agree with this statement. Most of them strongly disagreed.

Student/teacher relationship is enhanced when ThinkAbout *is used*: In general, the teachers agreed that *ThinkAbout* did enhance the personal relationship between themselves and their students. Fifty-six percent agreed and an additional 15% strongly agreed.

ThinkAbout *shows possibilites for stimulating creativity*: Eighty-four percent of the teachers believed that viewing *ThinkAbout* stimulated their creativity.

Children don't need to watch television in school: The teachers did not agree that their students watched television at home and therefore did not need to watch in school (90%). Fifty percent disagreed and 40% strongly disagreed.

Teachers would encourage other teachers to use ThinkAbout: A large majority of the respondents (96%) agreed or strongly agreed that they would encourage their colleagues to use *ThinkAbout*; only 1% disagreed. This item received very strong support from the teachers; the scale score was 4.44 (out of 5).

Students find ThinkAbout *programs interesting*: The teachers strongly supported the statement that their students found *ThinkAbout* interesting (98%). The scale score was 4.51.

Ideas in ThinkAbout *are useful in teachers' personal activities*: Most of the respondents agreed or strongly agreed that *ThinkAbout* made positive contributions to their personal activities (92%);

only 1% did not agree. This item too received strong endorsement; the scale score was 4.21.

ThinkAbout *programs have relevance to students' day-to-day lives*: Ninety-eight percent of the respondents agreed that *ThinkAbout* was relevant to the day-to-day lives of their students. Fewer than 1% thought that the programs had no relevance to students' lives. This item also was emphatically supported; the scale score was 4.39.

Teachers bring up ideas from ThinkAbout *when teaching other subjects*: Most of the respondents (88%) agreed or strongly agreed that they used *ThinkAbout* ideas in teaching other subjects.

Students bring up ideas from ThinkAbout *when studying other subjects*: Seventy-four percent, or 357, of the respondents reported that their students used *ThinkAbout* ideas in other areas of their education. But this idea of transfer was not overwhelmingly endorsed; the scale score was 3.82.

ThinkAbout *programs present complex ideas better than teachers can in 15 minutes*: Eighty-four percent of the teachers agreed that *ThinkAbout* was better than they were at presenting complex ideas in a short time.

ThinkAbout *programs present more ideas than teachers can in one class period*: Teachers were lukewarm to this idea. A small majority (54%) agreed that *ThinkAbout* could present more ideas than they could in one class period. Twenty percent disagreed with this statement. The scale score was 3.49.

ThinkAbout *programs arouse discussion in class*: Eighty-eight percent of the respondents reported that the *ThinkAbout* programs did indeed generate discussion in their classrooms. Of those respondents, 70% agreed and 18% strongly agreed.

ThinkAbout *is suitable for students below fifth grade*: Teachers did not endorse using *ThinkAbout* below the fifth grade. Forty-one percent disagreed or strongly disagreed that *ThinkAbout* was appropriate for lower grades. Only 29% thought that it would be suitable for them. The scale score was 2.88.

ThinkAbout *is suitable for students above sixth grade*: A majority of the teachers (74%) agreed, but not enthusiastically, that *ThinkAbout* was suitable for students above the sixth grade.

Material is clearly presented in ThinkAbout *programs*: A large majority of respondents (87%) agreed that the *ThinkAbout* material was clearly presented. Four percent had no opinion. Fewer than 1% agreed with the statement. The scale score was 4.25.

Material is usually presented step by step in ThinkAbout *programs*: Ninety-four percent of the teachers reported that the *ThinkAbout* material was presented sequentially. Only 1% disagreed. This statement received a scale score of 4.22.

Attention to incidental details detracts from major ideas in ThinkAbout *programs*: Seventy percent of the teachers disagreed that minor details detracted from the presentation of *ThinkAbout*'s major ideas. Eight percent agreed to some degree that the details detracted. The scale score was 2.28.

Characters in ThinkAbout *are similar to fifth and sixth graders*: The great majority of respondents (91%) found the *ThinkAbout* characters similar to fifth and sixth graders.

ThinkAbout *programs present material not commonly available in existing curriculum material*: Seventy-nine percent of the teachers agreed that ThinkAbout presented material not usually available to them.

Situations in ThinkAbout programs are realistic: The great majority of respondents (94%) agreed that the ThinkAbout situations were depicted realistically.

Students can identify with characters in ThinkAbout programs: Four hundred and forty-three teachers (93%) agreed that their students identified with the ThinkAbout characters.

Students are bored with ThinkAbout: Ninety-one percent of the respondents disagreed or strongly disagreed with the statement that their students were bored with ThinkAbout. The scale score was 1.74.

Students feel that ThinkAbout programs are usually realistic: Eighty-seven percent of the teachers reported that their students felt that ThinkAbout was realistic. Only 4% reported that their students did not.

Most students participate in discussions of ThinkAbout programs: A majority of teachers (81%) agreed that most of their students participated in discussions of ThinkAbout.

Students feel ThinkAbout material is too hard to comprehend: Ninety-two percent of the teachers did not agree that their students found the ThinkAbout material too hard to comprehend. Only 1% considered it too difficult. The scale score was 1.86.

Students feel ThinkAbout programs talk down to them: Most respondents (90%) did not agree that the ThinkAbout programs made students feel that they were being talked down to. The scale score was 1.86.

Students are interested in ThinkAbout programs: Ninety-six percent of the teachers agreed that their students were interested in ThinkAbout. Teachers were fairly positive about this statement; the scale score was 4.24.

Students feel ThinkAbout is dumb: The great majority of respondents (96%) did not agree that their students found ThinkAbout dumb. This statement was strongly rejected; the scale score was 1.6.

Students are more interested in ThinkAbout now than in the beginning: Fifty percent of the respondents agreed that their students were generally more interested in ThinkAbout now than in the beginning. Forty-one percent saw no change in their level of interest.

Students' reaction to ThinkAbout is highly favorable: The great majority of teachers (95%) agreed that their students reacted favorably to ThinkAbout. Only two teachers disagreed. The scale score was 4.32.

Six additional items were intended to solicit the overall opinions and attitudes of teachers about ThinkAbout and were included in questionnaire 4. Teachers responded to these items in a very positively skewed manner. With three of the six, no one disagreed.

Students find ThinkAbout programs interesting: This question dealt with the teachers' perception of their students. There were no negative responses. The "strongly agree" category drew the majority of responses, 314 (70%). The "agree" category drew 29%. The scale score was 4.69. Teachers were even more positive about this statement in the fourth survey than in the third (scale score, 4.24).

ThinkAbout has high overall educational effectiveness: Again, there were no negative responses to this item. The "agree" category received 48% of the responses and the "strongly agree" category 45%. The scale score was 4.39.

ThinkAbout programs stimulate effective follow-up lessons: Most teachers agreed with this statement (47%) or strongly agreed (25%).

Other teachers should be encouraged to use ThinkAbout: The majority of the responses were in the "strongly agree" (49%) and "agree" (42%) categories. The scale score was 4.39. The pattern was similar to that in the third survey (scale score 4.44).

ThinkAbout is a useful learning device: One teacher disagreed with this statement, and 12 responses (3%) were neutral. "Strongly agree" and "agree" responses got 97% of all possible responses; the scale score was 4.48.

ThinkAbout is a useful teaching device: There were no negative responses to this statement. Ninety-five percent of the teachers agreed or strongly agreed that ThinkAbout was a useful teaching device. The scale score was 4.42.

Summary

Most of the teachers had a highly favorable opinion about ThinkAbout. With respect to student interest, relevance to student life, and the use of the materials in other classes, the responses were positive. Some questions were phrased in such a way that teachers had to disagree or disagree strongly to be consistent with their other responses. The responses to these questions corresponded with the high overall ratings of the series. These findings were not only consistent with one another but also consistent over surveys 3 and 4.

In survey 4, there were very few negative responses, and three of the six questions dealing with the teachers' reactions to ThinkAbout got no negative responses. The overall responses were very positive. In the opinion of these teachers, ThinkAbout was a good teaching and learning device, it stimulated follow-up lessons, and it had high overall educational effectiveness. They felt that the students found the programs interesting and that other teachers should be encouraged to use ThinkAbout.

Student Assessment of ThinkAbout

It was felt that a supplementary survey of students would add to the completeness of the surveys and corroborate or refute the teacher's perceptions. Hence, a questionnaire to assess student perceptions of ThinkAbout was added to the original survey design.

Survey Design

In keeping with the other four surveys, questionnaires were used to measure student opinions and attitudes about the ThinkAbout series. Included with the fourth survey to teachers were two student forms and instructions about which students to give them to. Students were provided separate envelopes and asked to mail their responses directly to the Evaluation Center in order to minimize teacher influence. Only students who had viewed ThinkAbout programs were tabulated; the total number of useable returns was 716. It is hard to calculate the exact percentage of returns, since the questionnaires were not mailed to students directly.

Findings

Of the 716 students surveyed, 372 (52%) were females and 326 (46%) males. The majority were sixth (53%) or fifth (42%) graders.

There were 15 fourth graders, 13 seventh graders, five eighth graders, and one ninth grader.

Students were presented with 26 Likert-type attitude items. All the data are presented in Table 54, along with the mean score for each item. While the data are generally positive, there are differences among the items.

ThinkAbout shows many interesting things not in our books: Of the students surveyed, most (89%) felt that ThinkAbout showed interesting things not found in their books. The modal category for this statement was "agree" with a frequency of 416. The mean score was 4.18. This was one of the higher-scoring items.

Most ThinkAbout programs are boring: Most of the students disagreed with this statement. Eighty-nine percent of the responses were "disagree" or "strongly disagree." The mean score was 1.76 (1 = strongly disagree). On the negative side, students disagreed with this statement more strongly than they agreed with most of the others.

Students like learning things from television: Most of the students (86%) stated that they like learning from television. The mean score was 4.19, putting this statement, too, among the more strongly positive.

ThinkAbout helps students come up with new ideas: "Agree" was the category chosen by most (52%) of the students when asked if ThinkAbout helped them come up with new ideas. They were followed by 196 students (28%) who strongly agreed with the statement. The mean score was 3.98.

ThinkAbout is not useful in solving problems: A majority of the

Table 54

Student Attitudes and Opinions about ThinkAbout*

	Strongly Agree	Agree	?	Disagree	Strongly Disagree	Mean Score
1. ThinkAbout programs show many interesting things that are not in our books (N = 710).	224 (31.5)	416 (58.6)	48 (6.8)	20 (2.8)	2 (0.3)	4.18
2. Most ThinkAbout programs are boring (N = 713).	6 (0.8)	31 (4.3)	45 (6.3)	334 (46.8)	297 (41.7)	1.76
3. I like learning things from TV (N = 707).	252 (35.6)	368 (52.1)	62 (8.8)	18 (2.5)	7 (1.0)	4.19
4. ThinkAbout programs help me come up with new ideas (N = 706).	196 (27.8)	364 (51.6)	92 (13.0)	45 (6.4)	9 (1.3)	3.98
5. ThinkAbout programs are not useful in solving my own problems (N = 704).	17 (2.4)	76 (10.7)	120 (16.9)	335 (47.2)	161 (22.7)	2.33
6. ThinkAbout helps me to think in new and different ways (N = 716).	147 (20.7)	406 (57.2)	96 (13.5)	54 (7.6)	7 (1.0)	3.89
7. ThinkAbout programs help me learn on my own (N = 712).	107 (15.0)	371 (52.1)	142 (19.9)	84 (11.8)	8 (1.1)	3.68
8. ThinkAbout programs help me say better what I really want to say (N = 714).	110 (15.4)	290 (40.6)	176 (24.2)	120 (16.8)	21 (2.9)	3.49

(continued)

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*Adjusted percentages in parentheses

Table 54 (continued)

	Strongly Agree	Agree	?	Disagree	Strongly Disagree	Mean Score
9. ThinkAbout has shown me how to solve problems on my own (N = 709).	139 (19.6)	396 (55.9)	107 (15.1)	56 (7.9)	11 (1.6)	3.84
10. ThinkAbout has helped me learn better ways to solve problems (N = 713).	187 (26.2)	400 (56.1)	79 (11.1)	43 (6.0)	4 (0.6)	4.01
11. ThinkAbout helps me organize my thinking (N = 711).	160 (22.5)	342 (48.1)	125 (17.6)	73 (10.3)	11 (1.5)	3.80
12. ThinkAbout helps me to see more than one way to solve a problem (N = 713).	233 (32.7)	413 (57.9)	38 (5.3)	27 (1.8)	2 (0.3)	4.18
13. ThinkAbout programs are easy to understand (N = 710).	292 (41.1)	313 (44.1)	68 (9.6)	32 (4.5)	5 (0.7)	4.20
14. ThinkAbout programs show me how to think clearly, step by step (N = 708).	164 (23.2)	365 (51.6)	118 (16.7)	53 (7.5)	8 (1.1)	3.88
15. ThinkAbout programs are dumb (N = 709).	7 (1.0)	13 (1.8)	34 (4.8)	201 (28.3)	454 (64.0)	1.47
16. ThinkAbout programs are better for younger students (N = 707).	57 (8.1)	94 (13.3)	144 (20.4)	316 (44.7)	96 (13.6)	2.58
17. I want to learn more about the things I see in the Think-About programs (N = 709).	157 (22.1)	358 (50.5)	131 (18.5)	55 (7.8)	8 (1.1)	3.85

(continued)

Table 54 (continued)

	Strongly Agree	Agree	?	Disagree	Strongly Disagree	Mean Score
18. Most ThinkAbout programs seem real (N = 712).	284 (34.8)	348 (48.9)	61 (8.6)	41 (5.8)	14 (2.0)	4.09
19. ThinkAbout helps me to understand things I learn in many other classes (N = 710).	103 (14.5)	322 (45.4)	154 (21.7)	112 (15.9)	18 (2.5)	3.53
20. I like ThinkAbout very much (N = 713).	367 (51.5)	254 (35.6)	60 (8.4)	26 (3.6)	6 (0.8)	4.33
21. I like to discuss things I see in ThinkAbout (N = 412).	105 (14.7)	361 (50.7)	117 (16.4)	104 (14.6)	25 (3.5)	3.59
22. I like ThinkAbout programs better now than when we first started watching them (N = 712).	206 (28.9)	309 (43.4)	108 (15.2)	72 (10.1)	17 (2.4)	3.86
23. I think more students should see ThinkAbout (N = 706).	359 (50.8)	270 (38.2)	55 (7.8)	17 (2.4)	5 (0.7)	4.36
24. All problems can be easily solved (N = 702).	57 (8.1)	136 (19.4)	113 (16.1)	225 (32.1)	171 (24.4)	2.55

students felt that ThinkAbout was useful in solving problems. Sixty-nine percent disagreed or strongly disagreed with the statement that it was not. The most popular response (335, or 47%) was to disagree. There were also many students (120, or 17%) who were not sure of the statement. The mean score was 2.33. This was one of the questions worded negatively to test student response patterns.

ThinkAbout helps students think in new and different ways: With this statement, 77% of the students either agreed or strongly agreed that ThinkAbout helped them think in new and different ways. The mean score was 3.89.

ThinkAbout helps students learn on their own: About 67% of the students agreed or strongly agreed that ThinkAbout helped them learn on their own. The modal response category was "agree," with a frequency of 371 (52%) students. The mean score was 3.68.

ThinkAbout helps students say better what they really want to say: The response to this statement was quite varied. The modal category was "agree," with 40% of the responses, followed by the "not sure" category, with 24%. Seventeen percent of the students disagreed with the statement and 15% strongly agreed. The mean score was 3.49.

ThinkAbout has shown students how to solve problems on their own: Of the students responding, 74% agreed or strongly agreed that ThinkAbout helped them solve problems on their own. The modal category was "agree," with 396 (55%) responses. The mean score was 3.84.

ThinkAbout helps learn better ways to solve problems: By far the most frequent response to this statement was "agree" (400 students, or 56%). The second most frequent was "strongly agree," with

187 (26%) students. The mean score was 4.01.

ThinkAbout *helps organize thinking*: Most of the students (49%) agreed that *ThinkAbout* helped them organize their thinking. They were followed by 22% who strongly agreed and 18% who were not sure. The mean score was 3.80.

ThinkAbout *helps to see more than one way to solve a problem*: There was strong overall agreement among the students on this statement. Ninety percent either agreed or strongly agreed. "Agree," with a frequency of 413 (58%), was the modal category. The mean score was a high 4.19.

ThinkAbout *programs are easy to understand*: Most of the students (85%) felt that *ThinkAbout* programs were easy to understand. The modal category was "agree," with 44% of the students, followed by "strongly agree," with 41%. The mean score was 4.20, putting this statement among the more positively received.

ThinkAbout *shows how to think clearly step by step*: Most students (75%) agreed or strongly agreed that *ThinkAbout* showed them how to think clearly, step by step. The mean score was 3.88.

ThinkAbout *programs are dumb*: There was very strong disagreement among students on this statement. Most students (63%) strongly disagreed and 201 (28%) disagreed. The mean score was 1.47. This statement received the strongest rejection of any.

ThinkAbout *programs are better for younger students*: The modal response category for this statement was "disagree," with 44% of the students. Twenty percent were not sure. Only 22% felt strongly that *ThinkAbout* was better for younger students. The mean score was 2.58. This question turned out to be too ambigious to be useful because of possible misinterpretation. Accordingly, the responses should be carefully interpreted.

Students want to learn more about the things seen in ThinkAbout: Most students (72%) stated that they would like to learn more about things in ThinkAbout. The mean score was 3.85.

Most ThinkAbout programs seem real: A large majority of the students (84%) agreed or strongly agreed that ThinkAbout seemed real. "Agree" was the modal category, with 49% of the responses. The mean score was 4.09.

ThinkAbout helps understand things learned in other classes: There were both positive and negative responses to this statement. The modal category was "agree," with 45% of the responses. Twenty-two percent of the students were not sure and 16% disagreed. The mean score was 3.53.

Students like ThinkAbout very much: Most of the students (87%) liked ThinkAbout. "Strongly agree" was the most popular response (51%); "agree" was the second most popular (36%). The mean score was 4.33. This was the second most positively received item.

Students like to discuss things seen in ThinkAbout: "Agree" was the modal category (50%), followed by "not sure" (16%). "Strongly agree" (15%) and "disagree" (15%) got nearly equal responses. This question would have elicited more useful information if the context (e.g., inside classroom, or outside classroom with friends) had been made clear. The table, too, should be interpreted with caution.

Students like ThinkAbout better now than when they first started watching: A majority of the students (72%) did like ThinkAbout more later than at the beginning. The mean score was 3.86. This can be interpreted as a positive reaction to the programs.

More students should see ThinkAbout: By far the majority of students felt that other students should see ThinkAbout (88%). This was the highest-rated statement.

All problems can be easily solved: Most of the students (56%) disagreed with this statement. It too may have been confusing to students, and the results are difficult to interpret.

Two ThinkAbout Programs Liked Most

The last two questions on the student questionnaire asked the students to name the two programs they liked best and the two programs they liked least.

The students were not supplied with a list of programs. As a result, the responses included names of programs, descriptions of themes of programs, descriptions of incidents, descriptions of characters, and so on. The result was an enormous variety of responses. Sometimes it was possible to identify the programs; sometimes it was possible to identify only the clusters or the incidents.

Although there is no discernible pattern in the selection of favorite shows, a few programs, a set of programs, and a cluster emerged as favorites. Three programs in cluster 13 were far ahead of the other programs in popularity. They were rated 1, 2, and 4 individually: 1) "There's Always a Risk," 2) "A Matter of Time," and 4) "Hanging In There". The total references to them, including theme (plane crash) and cluster descriptions, amounted to more than 1/4 of all the responses (365 of 1,432) and more than 1/3 of the positive ones. The program rated third was "Plan Ahead," with 44 responses. There was a tie for fifth place between two programs:

"One Thing Leads to Another" and "What's Important?" (cluster 11), with 33 mentions each. None of the other programs were mentioned more than 25 times. The responses were very widely spread, and each of the 60 programs was mentioned at least once. A choice of two out of 360 is sometimes hard to make; 15 students indicated that they liked all of them. One student indicated that he or she did not like any.

Two ThinkAbout Programs Liked Least

A counterpart to the question above produced a different result. None of the programs or groups of programs were singled out as least liked. Three shows that were mentioned by more than 20 students were: 1) "Blockbusting," 2) "Plan a City of the Future," and 3) "Why Bother?" The category with the largest number of responses, however, was "disliked more than two," with 92 responses (12%). Two respondents indicated that they did not like any of the programs.

The distribution of responses was widespread. There were a large number of "no responses" (47%) to this question.

Differences between Grades

Since grade was one of the major variables in this study, cross-tabulations were run between grades on all the attitudinal questions. The attitudes and opinions of the fifth and sixth graders were remarkably similar. The differences between the two grades were about 5% or less in all categories.

Summary and Conclusions

Overall, the responses of the students to ThinkAbout were very positive. Students did not feel that it was boring or dumb but felt that it was easy to understand and that more students should view it. They thought that the programs were realistic and liked them even better at the end of the year than at the beginning. Their opinions regarding the utility and the outcome of the programs were also highly positive. The last statement of the survey, "All problems are easily solved," which was included to check for variations in the responses, elicited a wide range of responses.

Some tentative conclusions seem warranted from these findings. To increase the likelihood of unbiased responses, the student surveys were kept anonymous. In addition, the responses were mailed directly to the Evaluation Center, not by the teacher. Thus it is reasonable to assume that the responses were not biased by teachers.

The student responses were highly favorable. Though it is evident that the students liked the programs and found them useful, there is not enough information in the surveys about why they liked them, or why they liked some programs and not others.

Basically, there seems to be a high correspondence between the student and teacher surveys in perceptions and opinions about ThinkAbout. Students expressed favorable opinions of the series, thus supporting teachers' views and their perceptions of student reactions. For example, most students thought that the programs were realistic and interesting and presented new material not usually found in books. Students also felt that the programs helped them to learn on their own, organize their thinking, and solve problems. They liked to discuss ThinkAbout and relate it to other subjects.

Perceived Impact of ThinkAbout

ThinkAbout was designed so that its major goals would be covered in 13 clusters of programs. The cluster objectives and major goals of the series were discussed in Section I of this report.

On the fourth survey, teachers were asked to rate the degree to which ThinkAbout was successful in meeting the goals of the series and the cluster objectives. Specifically, they were to rate how helpful ThinkAbout was in improving the skills of their students on a scale of 0 to 10, a score of 0 indicating "not at all helpful" and a score of 10 indicating "extremely helpful." There were 13 questions, each corresponding to the title of a cluster or a cluster objective. The data are presented in Table 55.

ThinkAbout helpful in finding alternatives: Fifty percent of the teachers gave a score of 8 or higher to this cluster objective. The modal category was 8 (112 cases) and constituted 25% of the responses. The overall mean score was 7.34.

ThinkAbout helpful in estimating and approximating: While more than 50% of the respondents gave a score of 7 or higher to this objective, it was the lowest-rated of the 13. The overall mean score was 6.74.

ThinkAbout helpful in giving and getting meaning: Almost half (48%) of the teachers rated this objective at 8 or higher. The modal category was 8 (115 cases). The mean score for the responses was 7.3.

ThinkAbout helpful in collecting information: This cluster objective was rated quite highly. One-quarter of the teachers gave it a score of 8, the modal category, and 1/3 gave it a 9 or 10. The mean score was 7.7. The respondents generally felt that

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Table 55

Skill Improvement by Cluster

Not at All Helpful — Extremely Helpful

Cluster	0		1		2		3		4		5		6		7		8		9		10		Mean Score	Ranking
	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%	N	%		
1. Finding Alternatives (N = 447)	1	0.2	--	--	--	--	6	1.3	13	2.9	62	13.9	51	11.4	92	20.6	112	25.1	44	9.8	66	14.8	7.34	5
2. Estimating and Approximating (N = 448)	1	0.2	1	0.2	3	0.7	16	3.6	24	5.4	90	20.1	63	14.1	88	19.6	80	17.9	35	7.8	47	10.5	6.74	13
3. Giving and Getting Meaning (N = 447)	1	0.2	--	--	--	--	16	1.3	17	3.8	46	10.3	73	16.3	90	20.1	115	25.7	51	11.4	48	10.7	7.26	6
4. Collecting Information (N = 449)	1	0.2	--	--	--	--	2	0.4	13	2.9	42	9.4	42	9.4	87	19.4	114	25.4	67	14.9	81	18.0	7.68	2
5. Classifying (N = 443)	1	0.2	--	--	3	0.7	8	1.8	14	3.2	59	13.3	59	13.3	96	21.7	87	19.6	52	11.7	64	14.4	7.25	7
6. Finding Patterns (N = 438)	1	0.2	--	--	7	1.6	6	1.4	20	4.6	61	13.9	66	15.1	78	17.8	94	21.5	55	12.6	50	11.4	7.09	11
7. Generalizing (N = 437)	1	0.2	--	--	1	0.2	7	1.6	16	3.7	72	16.5	64	14.6	74	16.9	109	24.9	48	11.0	45	10.3	7.10	10
8. Sequencing and Scheduling (N = 431)	1	0.2	--	--	--	--	5	1.2	14	3.6	71	16.5	63	14.6	82	19.0	98	22.7	48	11.1	49	11.4	7.16	9
9. Using Criteria (N = 425)	1	0.2	--	--	2	0.4	11	2.4	15	3.5	56	13.2	53	12.5	75	17.6	99	23.3	63	14.8	50	11.8	7.24	8
10. Reshaping Information (N = 424)	1	0.2	1	0.2	2	0.5	8	1.9	16	3.8	78	18.4	65	15.3	96	22.6	80	18.9	41	9.7	36	8.5	6.87	12
11. Judging Information (N = 423)	1	0.2	1	0.2	--	--	3	0.7	11	2.6	46	10.9	59	13.9	97	22.9	96	22.7	61	14.4	48	11.3	7.36	4
12. Communicating Effectively (N = 424)	--	--	--	--	--	--	4	0.9	8	1.9	48	11.3	41	9.7	82	19.3	105	24.8	64	15.1	72	17.0	7.64	3
13. Solving Problems (N = 422)	--	--	--	--	1	0.2	1	0.2	3	0.7	43	10.2	34	8.1	59	14.0	109	25.8	84	19.9	88	20.9	7.95	1

ThinkAbout was very helpful in improving the information-collecting skills of students.

ThinkAbout helpful in classifying skills: Two-thirds of the teachers rated this cluster objective at 7 or higher. The modal category was 7 (22% of the respondents). The overall mean score was 7.3. As high as it was, it was an average rating for this category.

ThinkAbout helpful in finding patterns: Although the modal score was high (8), 68% of the teachers recorded scores between 5 and 8. The mean was 7.1. In general, this was a low-rated area.

ThinkAbout helpful in generalizing skills: The mode was 8 (25% of the respondents). The mean was 7.1. It fell in the lowest third of the clusters.

ThinkAbout helpful in sequencing and scheduling: Seventy-three percent of the teachers recorded scores between 5 and 8. The modal category was 8; the mean was 7.2.

ThinkAbout helpful in using criteria: Fifty percent of the teachers recorded scores between 8 and 10. The modal category was 8; the mean was 7.2.

ThinkAbout helpful in reshaping information: A majority of respondents (75%) recorded scores between 5 and 8. The modal category was 7; the mean was 6.9. This was one of the lowest-rated cluster objectives.

ThinkAbout helpful in judging information: A great majority of respondents (361, or 85%) indicated scores on the positive side of the scale (scores 6 to 10). The distribution was bimodal, showing 7 and 8 as practically equal. The mean was 7.14.

ThinkAbout helpful in communicating effectively: More than 3/4 of the teachers (76%) gave positive scores ranging from 7 to 10 on the scale. The mean score was 7.6, with 105 responses in the modal category (8). In general, the teachers indicated that ThinkAbout was very helpful in improving the communication skills of their students. This was the third highest-rated area.

ThinkAbout helpful in solving problems: Problem solving was the highest-rated area of advancement. Three hundred forty respondents, or 81%, gave it scores between 7 and 10. The mean was almost 8.0; the modal category (109 respondents) was 8. Teachers felt that ThinkAbout was very helpful to the communication skills of their students.

Extent to which ThinkAbout was helpful to students: Teachers perceived that ThinkAbout was helpful in improving the skills of their students. The mean and median scores were consistently on the positive (upper) part of the scale, and the modal category ranged from 5 to 8. In all the skill areas investigated in this section, the respondents indicated positive reactions to the impact of ThinkAbout. The rank ordering of the mean scores for the 13 questions ranged from a low of 6.74 (estimating and approximating) to a high of 7.95 (solving problems). The scores for all these items from the fourth survey are included in Table 55.

In addition to the cluster objectives, the overall goals of ThinkAbout were assessed in terms of their outcomes as perceived by teachers. A score of 1 indicates a very low level of success, and a score of 5 indicates a very high level of success. The data are reported in Table 56.

Table 56

ThinkAbout's Success in Meeting Goals*

	Very Low Success	Low Success	Neither	High Success	Very High Success	Mean Success Score
Problem solving (N = 449)	1 (0.2)	11 (2.4)	153 (33.3)	242 (55.3)	36 (8.0)	3.7
Independent learning (N = 447)	— —	18 (4.0)	182 (40.7)	214 (47.9)	33 (7.4)	3.6
Effective expression (N = 443)	1 (0.2)	15 (3.4)	170 (40.4)	221 (49.9)	27 (6.1)	3.6
Manage own learning (N = 444)	2 (0.4)	23 (5.2)	221 (49.8)	174 (39.2)	24 (5.4)	3.4
Systematic reasoning (N = 443)	2 (0.4)	22 (5.0)	159 (35.9)	231 (52.1)	29 (6.5)	3.6
Flexible thinking (N = 441)	3 (0.7)	17 (3.9)	140 (31.7)	240 (54.4)	41 (9.3)	3.7

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*Adjusted percentages in parentheses

Strengthening students' ability to be problem solvers:—Sixty-three percent of the teachers rated *ThinkAbout* highly or very highly successful in strengthening their students' problem-solving abilities. The mean score was 3.7 (out of 5). This goal was the highest-rated.

Strengthening students' ability to be independent learners: One hundred eighty-two respondents, or 41%, reported that *ThinkAbout* had neither a low nor a high level of success in strengthening independent learning. Fifty-five percent reported that *ThinkAbout* had a high level of success. The mean score for this item was 3.6.

Strengthening students' ability to effectively express themselves: Many teachers reported *ThinkAbout* as having neither a high nor a low level of success in strengthening their students' ability to express themselves effectively. However, 56% rated the series as highly successful in this regard. The modal category was "high level of success" (50% of the responses). The mean score was 3.6.

Strengthening students' ability to manage their own learning: Fifty percent of the teachers rated this goal in the middle of the range. Forty-five percent observed a high level of success; 6% observed a low level of success. The mean score for this variable was 3.4. This goal was the lowest-rated.

Strengthening students' ability to reason systematically: A majority of teachers (59%) reported that *ThinkAbout* was highly successful in helping their students to reason systematically. The mean score for their responses was 3.6.

Helping students to think flexibly: Two hundred eighty-one respondents, or 64%, agreed that *ThinkAbout* had a high level of success in helping their students to think flexibly. The mean score for this item was 3.7. It was the second highest-rated by a very small margin.

Perceived success of *ThinkAbout* in attaining major goals: Teachers were asked to rate the success of *ThinkAbout* in strengthening their students' ability in six areas. The lowest mean score was 3.4, for the success of *ThinkAbout* in strengthening the students' ability to manage their own learning. Problem solving and flexible thinking had the top scores with a mean of 3.7.

Summary

The perceived impact of *ThinkAbout* on cluster objectives and major goals of the series was rated by teachers on the fourth survey.

The teachers felt that *ThinkAbout* was very helpful to their students in improving the skills identified in the 13 clusters of the series. In all 13, the majority of the responses were consistently on the positive (upper) part of the scale. The problem-solving objectives were the highest-rated.

Questions were asked about the impact of *ThinkAbout* on each of the major goals of the series. Its scores reflected a moderately favorable rating of success in achieving those goals.

Strengths and Weaknesses

This section covers teachers' general reactions to the series and their opinions of its strengths and weaknesses. The findings encompass all four surveys.

The initial reactions of teachers, as reported in the first survey, were very positive. A high proportion of them (90%) indicated that their reactions to the series were favorable. Fewer than 1% indicated that they were unfavorable. Eight percent had mixed feelings.

Most of these teachers (91%) perceived that their students were very favorably inclined toward the series.

At the end of one of the sections in survey 1, the teachers were asked an open-ended question about their overall reactions to the series, positive and negative. The open-ended questions elicited 234 positive and 29 negative responses. The favorable responses included both generalized statements, such as "good programs" and "excellent series" (79%), and specific statements, such as "practical" (12%) and "students like it" (3%). Similarly, there were a few generalized unfavorable reactions (38%), as well as specific statements such as "not practical" (14%) and "too hard to follow" (24%).

Similar questions, asking about both positive and negative experiences with ThinkAbout, were included in surveys 2 and 4. In survey 3, teachers were asked to elaborate on the strengths and the weaknesses of the series. Because the questions were open-ended, it seems best to report the most common positive and negative comments survey by survey. The reader will note changes over time as well as consistencies. Since many teachers indicated two or more positive or negative reactions, two responses were coded for each teacher.

When asked about positive experiences with ThinkAbout on the second survey, student interest (18%), help in problem-solving skills (16%), and stimulation of class discussion (14%) were the three cited most often. Of the 478 mentioned, aid in student creativity and realistic everyday situations to which students could relate were tied with 8% each. Only two teachers went to the trouble to indicate that they had no positive experiences.

A large majority of teachers did not respond to a question about negative experiences with ThinkAbout. Of those who did, a majority specified that they had had none (55% of those responding, 10% of the total responses). Seventy-five negative responses were recorded. Apart from the "miscellaneous" category (17%), equipment problems, schedule mix-ups by TV stations, and lack of time to show the programs were the three experiences most often mentioned. None of these exceeded seven in number (4%).

The last question in survey 2 asked for additional comments. The responses were very similar to those discussed above. Excellence of programs (21%), teachers' liking of programs (15%), and student interest (15%) were the three most frequent responses and constitute a majority of the 113 received. There were only eight negative comments; three of the eight indicated that the teacher's guide was poor.

To an open-ended question in the third survey about the major strength of ThinkAbout, the most frequent responses were that students related it to everyday situations (23%), that it was relevant to classroom experiences (16%), and that it helped in solving problems (10%). Seven percent of the 417 responses referred to student interest. Aid to student creativity (6%) and programs of high quality (6%) were also mentioned.

When asked to identify the major weakness of ThinkAbout, 21% of the respondents said there was none. Of the other 163 responses, the major criticism (from 12%) was that the programs were not realistic. Eight percent thought them too short. Among the other weaknesses mentioned were lack of teacher's guide (10%) and lack of flexibility in scheduling and/or lack of time for showing the programs (10%).

Teachers in the third survey were also asked for their suggestions for improving the series. Making the programs longer was mentioned by 14 teachers, and the need for a new teacher's guide by 10.

Questions about positive and negative experiences with ThinkAbout and an additional question seeking other suggestions were included again in survey 4. The specific questions about the best and the worst programs were added in this survey, since the teachers had had an opportunity to see most of the programs.

The three major positive responses were program quality (24%), student interest (19%), and teachers' liking the series (15%). Relevance to class and benefit to students were also mentioned frequently in the 460 responses. The number of negative experiences was comparatively much smaller--57. Lack of flexibility of scheduling (19%) and lack of time (12%) were the two most often mentioned. There were no discernible patterns in these negative responses.

The major suggestion for improving the series was for a new teacher's guide.

Three best programs in ThinkAbout: "A Matter of Time" and "There Is Always a Risk" tied for first choice (32), "Brainstorming" was second (31), and "Hanging In There" was third (24). There were no consistent patterns of choice among the programs. Although the ratings for Tip and Challenge programs were also inconsistent (high for some, low for others), Tip programs were usually mentioned more often. Cluster 13 was by far the most popular, followed by Clusters 1, 4, and 12. Every program in the series was noted as one of the three best by at least one respondent. (See Table 57.)

Three worst programs in ThinkAbout: Except for the last program in the series, "Plan a City of the Future," which got a very high number of negative mentions compared to other programs (15 out of 119), and "Make Something New," which got 8, only 39 of the 60 programs were mentioned at all, and none of the other 37 was mentioned more than three times. Clusters 8, 11, and 13 were not identified as clusters. (See Table 58, p. 175.)

Summary

The overall reactions of teachers, and of students as perceived by teachers, were very highly favorable. Though it is questionable whether the ratio of positive to negative comments can be used as a valid indicator of outcome, the open-ended comments were overwhelmingly positive. This was true throughout the study, from the first survey through the fourth. Though there were consistently positive attitudes and opinions about ThinkAbout, the questions about strengths, weaknesses, and positive and negative experiences brought out different aspects of the series. For example, "realistic," "relevant to classroom experience," and "help in solving problems" were considered

Table 57

Three Best Programs in the ThinkAbout Series

	Program Names	N	Adjusted %
1.	Why Bother?	13	1.6
2.	Brainstorming	31	3.9
3.	Blockbusting	6	0.8
4.	You Can Remember	10	1.3
5.	Estimating	9	1.1
6.	Approximating	6	0.8
7.	Using Estimating and Approximating	5	0.6
8.	Find Your Guide	1	0.1
9.	What's the Meaning?	2	0.3
10.	Meaning Is More Than Words	10	1.3
11.	Remember the Audience	5	0.6
12.	But What Does It Mean?	2	0.3
13.	The Bigger Picture	10	1.3
14.	Where Are You Coming from?	4	0.5
15.	Make a Present for the Future	5	0.6
16.	What Do I Know?	9	1.1
17.	Where Should I Go?	10	1.3
18.	What Should I Do?	3	0.4
19.	Ways To Remember	17	2.2
20.	Classifying Objects	5	0.6
21.	Classifying Information	6	0.8
22.	Stereotyping People	9	1.1
23.	There Are Many Ways To Go	2	0.3
24.	People Patterns	11	1.4
25.	Communication Patterns	17	2.2
26.	Cultural Patterns	3	0.4
27.	Nature's Patterns	7	0.9
28.	Search for the Unknown	10	1.3
29.	Drawing Conclusions	8	1.0
30.	Checking Conclusions	2	0.3
31.	Practice for Success	5	0.6

(continued)

Table 57 (continued)

Program Names	N	Adjusted %
32. One Step at a Time	3	0.4
33. Plan Ahead	17	2.2
34. Calm Your Jitters	11	1.4
35. What Are They?	7	0.9
36. How Do You Find Them?	2	0.3
37. How Do You Change Them?	1	0.1
38. Design a Language	5	0.6
39. Symbols	1	0.1
40. More Than You Think	2	0.3
41. Summarizing	6	0.8
42. Maps and Models	2	0.3
43. Get Ahead with Goals	4	0.5
44. Should I Believe It?	12	1.5
45. What's Important?	8	1.0
47. Point of View	2	0.3
48. Persuasive Techniques	3	0.4
49. Make a Deal with Yourself	9	1.1
50. Styles of Communication	3	0.4
51. Planning a Presentation	2	0.3
52. Making a Presentation	1	0.1
53. Making Your Point	4	0.5
54. Making It Come Alive	4	0.5
55. Make Something New	1	0.1
56. One Thing Leads to Another	10	1.3
57. A Matter of Time	32	4.1
58. There Is Always a Risk	32	4.1
59. Hanging In There	24	3.0
60. Plan a City of the Future	2	3.0
Cluster 1	32	4.1
Cluster 2	16	2.0
Cluster 3	20	2.5
Cluster 4	28	3.6

(continued)

Table 57 (continued)

Program Names	N	Adjusted %
Cluster 5	12	1.5
Cluster 6	17	2.2
Cluster 7	8	1.0
Cluster 8	10	1.3
Cluster 9	21	2.7
Cluster 10	4	0.5
Cluster 11	25	3.2
Cluster 12	27	3.4
Cluster 13	83	10.5
Tip--unspecific	4	0.5
Other	28	3.6
No response	592	Missing
Total	1380	100.0

Table 58

Three Worst Programs in the ThinkAbout Series

Program Names	N	Adjusted %
1. Why Bother?	1	0.8
3. Blockbusting	1	0.8
4. You Can Remember	1	0.8
5. Estimating	1	0.8
6. Approximating	2	1.6
7. Using Estimating and Approximating	1	0.8
8. Find Your Guide	3	2.5
9. What's the Meaning?	1	0.8
10. Meaning Is More Than Words	3	2.5
11. Remember the Audience	3	2.5
12. But What Does It Mean?	1	0.8
13. The Big Picture	2	1.6
14. Where Are You Coming from?	3	2.5
15. Make a Present for the Future	2	1.6
16. What Do I Know?	1	0.8
17. Where Should I Go?	2	1.6
20. Classifying Objects	1	0.8
22. Stereotyping People	2	1.6
24. People Patterns	3	2.5
26. Cultural Patterns	2	1.6
27. Nature's Patterns	2	1.6
28. Search for the Unknown	2	1.6
29. Drawing Conclusions	3	2.5
30. Checking Conclusions	2	1.6
32. One Step at a Time	2	1.6
34. Calm Your Jitters	1	0.8
35. What Are They?	3	2.5
36. Where Do You Find Them?	1	0.8
38. Design a Language	1	0.8
40. More Than You Think	3	2.5
41. Summarizing	2	1.6

(continued)

Table 58 (continued)

Program Names	N	Adjusted %
46. What's Enough?	1	0.8
47. Point of View	2	1.6
48. Persuasive Techniques	2	1.6
50. Styles of Communication	1	0.8
54. Making It Come Alive	1	0.8
55. Make Something New	8	6.6
59. Hanging In There	1	0.8
60. Plan a City of the Future	15	12.3
Cluster 1	1	0.8
Cluster 2	7	5.7
Cluster 3	2	1.6
Cluster 4	4	3.3
Cluster 5	1	0.8
Cluster 6	3	2.5
Cluster 7	2	1.6
Cluster 9	1	0.8
Cluster 10	3	2.5
Cluster 12	1	0.8
Other	8	6.6
No response	1258	Missing
Total	1380	100.0

the major strengths; "unrealistic" and "too short" were considered the major weaknesses. The positive experiences most often cited were "program quality," "student interest," and "teacher liking"; the negative experiences most often cited were "lack of flexibility" and "lack of time."

Use of ThinkAbout during the Next Year

Plans for the use of ThinkAbout during the coming year were asked of teachers on surveys 2, 3, and 4. Throughout the three surveys, the responses were quite similar. (See Table 59.)

Table 59

Plan To Use Next Year

	Survey 2		Survey 3		Survey 4	
	N	%	N	%	N	%
No	13	3.0	11	2.6	16	3.5
Not sure	67	15.5	50	11.7	35	7.7
Yes	351	81.4	365	85.7	404	88.8
Totals	431	100.0	426	100.0	455	100.0

Overwhelmingly, teachers indicated that they would continue to use the series. On the fourth survey, many (28%) of those not currently using the series indicated a strong interest in using it for the next year.

The reasons teachers provided for planning to continue the series included student interest, program quality, and a range of teacher and student benefits. Scheduling problems were the most frequent reason given for planning not to use the series.

Summary

A large majority of users planned to use ThinkAbout during the next year. Some nonusers planned to use it too, though a large proportion of nonusers were not sure. The main reasons cited for using the series were student interest, high quality, and excellence of programs. The main reasons cited for not planning to use the series next year were next year's schedule unknown and scheduling problems. The reasons given also corresponded with the responses about experiences with and strengths and weaknesses of the series.

Summary

Survey research was one of the three techniques used in this study. The others were testing and case study inquiry. In this summary, only the findings of the four ThinkAbout surveys are included. The integration of survey findings with the testing and case study findings are presented in Section V.

Sampling for the surveys created many problems. There was no known population of ThinkAbout users, and many sources had to be contacted before a sampling frame could be constructed.

As names of actual users, probable users, and contact persons accumulated, the sampling frame for each successive survey became larger. In each study the frame was stratified into three categories: 1) users, 2) probable users, and 3) contacts (individuals and agencies). Systematic samples were drawn from each. Follow-up letters helped in getting an average response rate of 2/3. The respondents comprised both users of ThinkAbout and nonusers, but most of the analyses were limited to the users. Some of the respondents were included in more than one sample. The questionnaire survey studies covered 36 states and provinces.

There were no obvious major differences in characteristics between the users and the nonusers. ThinkAbout was known to most users and nonusers. Most of the teachers did not attend orientation meetings or workshops on ThinkAbout, although those who did considered them useful.

The teachers thought that the ThinkAbout teacher's guides were quite useful and that additional teaching materials, especially duplicate masters, would be quite useful also.

ThinkAbout teachers stated that there were no pressures either to adopt or not to adopt ThinkAbout and that the decision to adopt ThinkAbout was their own, although they received much support from their students. The series was produced for fifth and sixth graders; nonetheless, usage extended in many cases to the fourth and the seventh grades and occasionally even beyond. Typically the programs were viewed in classrooms of 20 to 30 students by way of public television broadcast. TV equipment was readily available to teachers, and they had an option to select the programs they preferred. The programs were usually viewed twice a week. Discussions before viewing lasted about seven minutes, discussions after viewing lasted about 12 minutes, and the programs were 15 minutes long. Teachers found the scheduling of the series on the air convenient and acceptable. At least 1/4 of the teachers stated in the fourth survey that their class(es) had viewed all, or almost all, of the 60 programs.

Initially, ThinkAbout was more often used as a separate subject than integrated with other subjects. However, by midyear, most teachers had integrated it with an established curriculum area. In a few cases it was integrated with more than one. Study skills and language arts were most often mentioned as the subjects with which it was integrated. ThinkAbout was used as a supplement to the traditional curriculum. The skill area with which it could best be integrated in the teachers' judgment was study skills, followed by language arts. The potential for integrating ThinkAbout with these skills was rated very highly by the teachers.

Teachers' opinions and perceptions of student reactions to ThinkAbout were uniformly positive. Most were favorable or highly favorable. Responses to a set of 35 questions in surveys 3 and 4 were to a very large extent favorable. The questions covered a wide range of areas: for example, appraisal of programs (stimulating creativity, relevance, realistic situations, educational effectiveness, useful learning device), student reactions as perceived by teachers (interest, gaining more interest, identification with characteristics, highly favorable reaction, usefulness, lack of boredom) importance of teacher role (useful teaching device, presentation of ideas, presentation of complex ideas, importance of teacher in class), presentation of material (unavailable in existing material, hard, easy, dumb, clear, step by step), relevance to other subjects, effect on class discussions, and suitability of material for different grades.

Similarly, teachers were asked in the fourth survey to assess how well ThinkAbout succeeded in attaining its major goals and the cluster objectives. A majority of the teachers felt that ThinkAbout had a high rate of success in strengthening students' ability to be independent learners. An even larger proportion of them rated ThinkAbout successful (highly successful or very highly successful) in strengthening students' ability to be problem solvers. Similarly, questions about cluster objectives elicited favorable responses. On a scale of 0 to 10 (0 indicating not at all helpful and 10 indicating extremely helpful), the lowest mean score for those who responded was 6.7 and the highest was close to 8. The cluster objective that referred to problem solving was again rated very highly.

ThinkAbout users were also asked about strengths and weaknesses of the series and positive or negative experiences with ThinkAbout. These open-ended questions, included in all four surveys, elicited a great variety of responses, mostly positive. The major strengths of ThinkAbout mentioned were the content of the programs ("good content") or the quality of the programs ("excellent series"), referring to their relevance and usefulness in helping students learn to solve problems. There were fewer comments on the weaknesses of the programs. The negative comments were that they were not realistic, too short, or too hard to follow. In surveys 2 and 4 a corresponding question was phrased differently; teachers were asked about their positive and negative experiences with ThinkAbout. Again, a larger number of teachers reported positive experiences. Student interest, program quality, help in problem solving, and liking programs were those most commonly reported. The most commonly reported negative experiences were scheduling problems, equipment problems, and lack of time. Many teachers indicated that they had had no negative experiences.

A very large proportion of the teachers indicated (in three surveys) that they planned to use the series during the next year. Their reasons were similar to the responses mentioned above: quality of programs, student interest, program effectiveness, and liking the programs. Of those who did not plan to use it, scheduling conflicts, a lack of flexibility in scheduling, and the uncertainty of next year's schedules were the reasons cited most often. Most teachers liked the series and planned to use it during the next year.

V. INTERPRETATIONS, CONCLUSIONS, AND IMPLICATIONS

This section of the report brings together the findings of the several ThinkAbout studies--testing, surveys, and case studies. It relates those findings to the adoption, use, and impact of ThinkAbout and to the development of new instructional television series, new curricula, and new technologies in the schools. The interpretations, conclusions, and implications are synthesized from a variety of sources, including the vast amount of information gathered and analyzed during this project; literature pertaining to instructional television, child development and problem-solving behavior, and classroom processes; and the authors' experiences with schools. In the first part of this section we organize the information available to us to form conclusions that we can present with reasonable certainty. In the second part, we return to the original questions that guided this study and provide our answers to them. In the third part, we provide a statement of what we see as the implications of these studies.

Interpretations and Conclusions

This set of research studies was designed to explore three broad areas: the adoption and use of ThinkAbout; its effects on students; and ideas for the design, production, and use of future series.

How a new instructional television series comes to be used in a classroom, how it is used and received by children and teachers, and how it fits (or does not fit) into the reality of classroom (and out-of-classroom) life for children and teachers have been little studied or questioned. As Schaefer (1967) noted:

> The new curriculum movement has been relatively indifferent to the plight of teachers. . . . How can youngsters be convinced of the vitality of inquiry and of discovery if the adults with whom they directly work are mere automatons who shuffle papers, workbooks, and filmstrips according to externally arranged schedules? . . . As I see it, the new curriculum movement cannot attain its full effect until it finds viable means of attracting teachers to the intellectual excitement it seeks to create in children. (Schaefer, 1967, p. 51)

Schaefer's comments are as relevant today as they were over a decade ago. Knowledge about the actual classroom use of television is essential to the preparation of effective new curricula. Wolcott noted his amazement at how many "experts" there are on the topic of instructional television. One has to question how many of these people speak about classroom teachers but not for them. Knowledge about the adoption and use of ThinkAbout can contribute to our understanding of instructional television and new curricula.

What is known about the effects of particular instructional television series on children has received more attention. Noteworthy studies of the impact of instructional television series include those by Ball and Bogatz (1970), Cook et al. (1975), Mielke and Swinehart (1976), and Johnston, Ettema, and Davidson (1980). We have gained some insights from this study that will help us to better understand what happens to children (and what is reasonable to expect to happen) when television is used for instructional purposes. We have also identified questions that remain to be answered.

What is known about the design and production of instructional television would take volumes to report systematically. Monographs, chapters, and books such as those by Schramm (1972), Ide (1974), Salomon (1974), Wood and Wylie (1977), Lesser (1974), and Chu and Schramm (1979) have addressed this topic in great detail. We have learned, for example (Chu and Schramm, 1977; Schramm, 1972; Ide, 1974), that television is an effective medium for dramatization and demonstration. It can bring "faraway places" into the classroom and take students out of the classroom. It is motivating. It can be used to associate abstract concepts with concrete situations. It is at its best when it gives students emotional experiences and food for thought, provides humor, uses skilled actors, good music, and sound effects, and repeats concepts in different ways. ThinkAbout does all of these things. There is little that this research can add to this accumulation of knowledge except to confirm and reiterate the important attributes of successful programs.

Adoption and Utilization

There is a need for producers of instructional television to listen to school staff discuss their uses of it (see Pike, 1977, and Richardson and Richardson, 1977).

Lortie (1975) stressed the importance of studying the reality of classroom processes as follows:

> Changes [in the classroom] are proposed and initiated without sure knowledge of the settings they are presumed to improve. Without a clear picture of school reality, efforts at rationalization can dissolve into faddism and panacean thinking. (Lortie, 1975, p. vii)

This is consistent with Ide's (1974) conclusion that the effective use of television is more likely to be related to good teaching than to anything else. Chu and Schramm (1977) also provide support for this conclusion.

Teachers came to use ThinkAbout in a variety of ways and for a variety of reasons but they, as individuals, were a major determiner of whether the ThinkAbout curriculum was to be adopted and continued. This is consistent with Lortie's (1975) observation that most younger teachers control their own destinies.

> These teachers give assent to norms which reflect dependence on self rather than others and personally held rather than "vertically authoritative" opinions. . . . teachers who hold to [this viewpoint] put themselves in the "gatekeeper" position over activity in their classrooms. They picture themselves as standing between the students and "external" influence; it is incumbent upon them to assess classroom events in light of their personal judgment. (Lortie, 1975, p. 75)

Lortie (1975) provided some additional insights into the adoption process:

> Teachers were asked to select the most important source of "ideas and insight on my work," from a list including in-service courses, meetings in the system and elsewhere, their immediate supervisor, and "informal conversations with colleagues and friends." . . . The last. . . was chosen by 37 percent of the total sample and 47 percent of teachers in their twenties. Informal channels are preferred to the institutionalized means, and the peer group rather than administrative superiors . . . is seen as the most salient source of classroom ideas. (Lortie, 1975, pp. 75-76)
>
> They do not refer to learning general principles of instruction from colleagues; when they refer to peer influence, they talk about specific kinds of classroom activity. They describe the "tricks of the trade" they picked up. . . .
>
> The respondents qualified the flow of interpersonal influence in two ways. First, to be adopted a practice must be seen as consistent with the receiver's personality and "way of doing things." . . . The teacher mediates between ideas and their use in terms of the kind of teacher he is.
>
> The second major qualifier is closely linked to the first. The value of any collegial practice is unknown until the receiving teacher has tried it in the classroom and decided that "it works." . . . The practice must work "for me," and the teacher is the judge of what works. (Lortie, 1975, pp. 77-78)

Lortie stresses the personal nature of a decision to adopt new curricula and teaching techniques and the importance of trying new things before decisions are made. Farrar, DeSanctis, and Cohen (1980) have suggested that teachers doing pretty much as they please with new programs is analogous to a "lawn party." This may reflect the personalization that occurs with any new curriculum adoption.

Brochures sent to all fifth and sixth grade teachers by AIT and state-supported orientation sessions were effective, as far as they went, in getting the word out. Wolcott identified some additional topics--rights, membership, obligations, and rationale--that should be considered in future dissemination efforts:

> Who can do what with videotapes made for school use? . . . I was surprised at the confusion expressed with district and county level people, and . . . I am not sure it is a good thing. A district-level media specialist who tapes any programs requested by teachers in the district noted that there are some differences between commercial broadcasts and public broadcasts, but he seemed unable to say more than that tapes made from commercial broadcasts were not supposed to be kept very long. . . . At county level, a media specialist recognized that ThinkAbout could be videotaped but was uncertain if there was a time limit. . . . The state level media specialist expressed no uncertainty: "We are an owner because this state is a consortium member. We can tape the series and duplicate it." My point is that the same sense of ownership felt at state level was not felt so clearly at county and district levels. . . .
>
> Who needs to know if a state is a consortium member, and what do they need to know? . . . Only from a member of the State Department of Education did I hear the term "we" in reference to consortium participation.
>
> Teacher uncertainties centered on what constituted "proper use," sorting out obligations from options. Like their students, teachers too, want to know, "Do we have to do this?" . . . One teacher's comments express the range from a concern that she might not be using the series as "they" hoped she would to her candid conclusion that in fact she was going to use it just as she pleased. . . .

> Some teachers also noted the need to be able to explain, and if necessary even defend, their use of classroom television. I sensed no feelings of overt defensiveness about the use of television . . . but teachers did mention that they felt obliged to be _able_ to explain the instructional basis for their use if pressed for such an explanation. (Wolcott, pp. 51-53)

One has to question how far the AIT and state mail-outs reached, given the multiple layers of recipients of this communication. For example, in his September 24, 1979 field notes, Wolcott remarked:

> . . . in Oregon, at least at this first opportunity for viewing [_ThinkAbout_], I am skeptical that many teachers have even heard of the series, have any idea when it will begin, or have any intention of using it in their classrooms. Word simply has not filtered down. It is a nice paradox: communication through TV as a curricular "answer" is hampered by communication as a problem. The unhappiest people seem to be those in the middle—people at central office, county, or state department levels who feel they should know more about the series than they actually do. The few intermediate grade teachers I've talked to are totally oblivious: they haven't heard about the series and have no intention of using it (unless they are forced to).

Cohn also observed a communication problem in her field report dated October 8, 1979:

> There appears to be a great distance between the AIT and the classroom teacher. As I've experienced it there are these multiple layers:
>
> State department
> District curriculum personnel
> Media specialists
> Head of elementary principals
> Building principals
> Building instructional specialist
> Classroom teacher.
>
> To filter down, a lot of effort and communication is necessary. To date, such effort and communication have not occurred.

It became clear from the case studies that the effective use of television is related to good teaching. For example, Wolcott noted:

> The most interesting element in this year's observations has been the realization that . . . the teacher . . . is the gatekeeper and interpreter who decides both what is to constitute a classroom "lesson" and the manner and extent to which any particular lesson will be pursued. . . . ThinkAbout provided a 15-minute respite . . . but it also also presented most teachers I observed with a "moment of truth" when they had to step in and make the move--or at least start the filtering process leading to it--that would eventually determine what the lesson would be. (Wolcott, pp. 16-17)

There were several factors that affected the decision how to use ThinkAbout, and these were also powerful influences on the rest of the curriculum used in a classroom. One factor was pressure from the school administration to keep performance levels up on standardized achievement tests. Although "back to the basics" is a recurring cliché in contemporary schooling, it is also a real pressure that teachers must contend with when they plan instruction. In the words of one teacher described in a case study:

> I feel the pressure very strongly. Now this is the first year we didn't have a printed list of test scores with each teacher's scores, and their class average listed separately, but I do feel that our principal bases a lot of his evaluation on a teacher's test scores. . . . And the ironic thing is that if you give a skill test right after you've studied it, then most of [the students] can get an 80% on it. You wait a couple of weeks, and then you give it to them and they'll say, "Well, why didn't you give this to us before? We've forgotten it." So do these tests really show that they've mastered? (Cohn, p. 24)

Teachers were seen to behave as if curriculum aimed at improving standardized test performance could only be provided through strict adherence to a commercially available textbook. Cohn described Ms. Church's teaching style, for example, as 1) a large group opening exercise, 2) faithful adherence to the test, 3) little rationale for work, 4) few explicit transitions, and 5) when using questions, requiring students to give short or single-word factual answers. The ThinkAbout curriculum design provides an interesting contrast to this teaching style. Another side of teaching with ThinkAbout, however, is seen in the Mr. Cartwright case study, also reported by Cohn.

Standardized test publishers claim that the tests measure what the curriculum textbook publishers cover, and the textbook publishers claim that they cover content that will prepare children for the tests. In a sense, this is a closed system in which teachers are caught and which affects how new curriculum materials are used in the classroom.

Related to the influence of textbooks and tests (and the pressure to focus on them placed on teachers by school administrators) is a predisposition by teachers to follow structured daily routines, including short time segments for units of instruction. If curriculum material does not fit the pattern, there is a tendency to neglect the materials rather than change the schedule. For instance, Cohn reported in one case study:

> Each morning, before the students arrive, Ms. Church writes the "schedule" for the day on the chalkboard, but there is not much variation across days. On Tuesday and Thursday, the lineup looks much like this:
>
> 9:00 Pledge, etc.
> Spelling
> Language
> Reading

11:15	Lunch
11:45	Story time, rest room
	Math
1:00	ThinkAbout
	Finish math
	Snack, rest room
	Social studies (or science)
2:45	P. E.
3:15	Summary
3:20	Announcements
	Dismissal

> On Mondays and Wednesdays, ThinkAbout is omitted, and music, art, and library are inserted for 30 minutes each. Within each day there is also less diversity than the schedule implies. Although language, science, or social studies consistently appear on the board, they rarely occur. Each day therefore tends to break down into the same three large segments: spelling (with language occasionally incorporated), reading, and math. (Cohn, p. 28)

This observation, combined with the short attention spans of fifth and sixth grade students and a tendency for teachers to be impatient with unstructured teaching situations, can present dramatic clashes with problem-solving curricula. The case study reports give us reason to believe that each of these factors, alone and in combination, exist in classrooms where ThinkAbout is used. One teacher, for example, described the suggested project activities in the teacher's guide as "general, abstract, and time-consuming."

Lortie (1975) discussed teachers' quests for using time productively and for avoiding what he called "inert time." Objections to fringe subjects were made by elementary teachers who would prefer to spend their time on "basic" subjects like arithmetic and reading.

> Teachers' objections to inert time are understandable. . . . First, we can think of time as the single most important general resource teachers possess in their quest for productivity and psychic reward; ineffective allocations of time are costly. Second, from one perspective teaching processes

> are ultimately interminable; one can never strictly say that one has "finished" teaching students. At what point has one taught every student everything he might possibly learn about the curriculum? (Lortie, 1975, p. 177)

The 1979-80 school year was the first year that ThinkAbout was available to teachers. They had no exposure to the programs or the curriculum (except for brief workshop orientations for some teachers) before actually teaching with it in their classrooms. Many teachers did not prepare ThinkAbout lessons ahead of time and were not sure what to expect from a given program. In the Ms. Church case study, for instance, the teacher gave as one reason for her frequent use of instructional television the "fact" that it required no prior planning.

> When I use TV, I like it to be right there for me. I like it to let me know exactly what to do. If they have a suggestion for a game or something that will bring a point up, I want it written. If I have to come up with all those ideas on my own, then it's just as easy for me to use the textbook or to use a film or something. (Cohn, p. 44)

Wolcott concluded:

> At one extreme were teachers who simply "took it as it came," epitomized by a teacher who had no teacher's guide, selected programs by title from videotapes prerecorded at the school district central office, and reported, "I just watch it with the kids and punt from there." (Wolcott, p. 18)

This circumstance led in some cases to teaching that missed the key idea of a lesson and to unproductive discussions, which focussed more on the story line of a program or on personal experiences than on skill or concept development. As a case in point, consider Ms. Hausman's comments, reported by Cohn:

> You know, I knew that introduction was not exactly right for this program, but it was the only way I could think of to tie it to their own experience . . . and, you know, I'm almost ashamed to admit it, but I saw that program three times, but it wasn't until the end of the third time that I really saw what was happening at the end. (Cohn, p. 149)

Teachers also needed to be able to ask good questions and to control discussions if ThinkAbout discussion time was to be well-spent. An example of effective teaching with ThinkAbout, in the Mr. Cartwright case study, included "several minutes of questioning to quickly assess comprehension after each ThinkAbout program" (Cohn, p. 119). As a contrast, consider Cohn's comments on the teacher's questioning skills found in another case study:

> More often than not, Ms. Hausman failed to move the discussion from the story to the idea behind the story, and in most instances the failure seemed to rest with a lack of questioning and discussion skills.
>
> A case in point is the discussion after Program 12, "But What Does It Mean?" . . . In this discussion, Ms. Hausman did not help the students interpret the meaning through her own questions; she asked only, "What do you think?" and "Do you have any idea what the terrible secret is?" In this discussion, Ms. Hausman did not encourage students to interpret the meaning through their own questions; there was only one student query. In fact, instead of focussing on the process of interpretation through questioning and discussion, the experience for students was one of making wild guesses as to the terrible secret. (Cohn, p. 152)

There is reason to believe that in-service training of teachers on 1) the specific new curriculum, its objectives, and its conceptual framework, 2) effective teaching methods that may be used with the new curriculum, and 3) the use of television in the classroom (see

Hilliard and Field, 1976) are important to the total picture of how a new series affects students.

Related to the newness of the curriculum was the observation that teachers seldom gave their class ThinkAbout assignments. There was a noticeable lack of practice or application in ThinkAbout classrooms as new skills or concepts were presented. However, Ms. Church's lack of follow-up can be contrasted with Mr. Cartwright's assignments (Cohn, pp. 121-22).

Moreover, the grading of ThinkAbout activities was not seen or reported in classrooms where ThinkAbout was being used. These deficiencies are contrary to what we know about good instruction (see Gagne, 1974, for example). A failure to legitimatize the curriculum through assignments and grading could be seen as an indication of how much importance teachers assigned to ThinkAbout.

Still another influence on the ThinkAbout curriculum observed during the study was the predisposition of the classroom teacher to use ThinkAbout. Teachers appear to approach new curricula with varying degrees of enthusiasm and commitment, which in turn influence the prominence of the new material in the total curriculum. Lortie (1975) refers to a basic conservatism found in teachers, who look for "more of the same." It is hard for many of them to shift from the pedagogical strategies of the past.

A teacher described in one of the ThinkAbout case studies as a strong advocate of the series provided the following analysis of ThinkAbout's chances in the classroom:

> I think it's going to go down the tubes because I think for it to be effective it takes a lot of input from the teachers and a lot of effort and time and energy. And I don't

> think 98% of your teachers are going to want to do it. . . . As good a program series as it is, I think it's going to sit on shelves because teachers won't make the effort to use it or use it properly. (Cohn, p. 136)

However, even those who appear to be highly enthusiastic at the onset of a series can change during the year. One year of sustained commitment is a very long time. Factors that were observed to affect enthusiasm over the year included lengthy teacher illness (and the need to catch up on return), frustration with repeated or out-of-sequence broadcasts, the introduction of a student teacher (Hart-Landsberg's description of Pamela vividly brings this intervention to life), activities competing for limited school and teacher time, holidays and other "missed" sessions, anxiety over progress in high-priority curriculum areas (e.g., math and reading), and "losing track of the series" because of other interventions. As an illustration, a teacher in Oregon took the time to write a personal letter to an Evaluation Center staff member, which said:

> Since the beginning of 1980, the following programs have been repeated:
> Nature's Patterns, Program 27
> Checking Conclusions, Program 30
> One Step at a Time, Program 32
> Plan Ahead, Program 33
> Where Do You Find Them?, Program 36
> Summarizing, Program 41
> Should I Believe It?, Program 44 (three times)
> Make a Deal with Yourself, Program 49.
> My class has lost interest and no longer looks forward to Tuesdays and Thursdays at 10:15 a.m.
> (Dated March 27, 1980)

Hart-Landsberg noted in her case study of Marie: "Pre-show discussions diminished as Marie lost faith in correspondence between the guide and broadcasts." (Hart-Landsberg, p. 24)

Each of the influences discussed above may have affected the actual classroom use of ThinkAbout. Each was known to exist. The consequence of having these seemingly extraneous factors operate in the classroom led to a noticeable diversity in the use of ThinkAbout in fifth and sixth grade classrooms. Evidence of the diversity may be seen in the end-of-year questionnaire responses supplied by teachers in the testing study (Section III) and in the survey teacher reports (Section IV). Diversity in teacher planning and preparation, in opportunities provided students for practice and application, in the quality of discussions, in references to ThinkAbout during other instruction, and in sustained teaching aimed at ThinkAbout goals all reflected and affected the teacher's commitment to the curriculum. Since the flexible use of the curriculum was an object of ThinkAbout's designers, success may be claimed. This diversity also provides a background for understanding the effects of ThinkAbout on students.

Effects on Students

The effects of instructional television may be assessed by different standards: the achievement of curriculum goals related to student change (the primary outcomes of instruction), the attention-holding capability of the programs, the satisfaction of users, and curriculum changes due to the introduction of the series are among the most important (Schramm, 1972). This part of the discussion focusses on the effects on students.

As is true of many curriculum projects, expectations of what ThinkAbout would do for fifth and sixth grade students were diverse and ranged from the very conservative to the unreasonable. Empirical justification for using the series cannot be found in basic skills improvement. Perhaps it may be found in applied project-related skills, but the evidence is sparse. Some weak movement was seen on the ThinkAbout-specific testing instruments, but again the evidence is weak.

Given a situation where measurement instruments were selected and developed according to expectations for student effects prior to the availability of the television series (or classroom experience with it), it is not surprising that the measurements were off target or insensitive to the student changes that took place. In classes where students were already receiving large doses of basic skills instruction, ThinkAbout had little opportunity to show a great effect on students. In the context of classrooms with many competing programs, the day-to-day lives of preadolescents, and wide variation in the series' use, expectations for effects on students must be tempered. This research has led us closer to knowing what to look for and how to measure it, but it has not provided conclusive evidence of the nature and amount of student change.

We have learned from child psychology that important changes in abstract reasoning (or concrete reasoning, for that matter) take years of cumulative effect to develop. Flavell (1977) noted, for example:

> The elementary school child's characteristic approach to many conceptual problems is to burrow right into the problem data as quickly as possible, using his or her various concrete-operational skills to order and interrelate whatever properties or features of the situation he can detect. His is an earthbound, concrete, practical-minded sort of problem-solving approach, one that persistently fixates on the perceptible and inferable reality right there in front of him. His conceptual approach . . . does, however, hug the ground of detected empirical reality rather closely, and speculations about other possibilities,

> i.e., about other potential, as yet undetected realities, occur only with difficulty and as a last resort. (Flavell, 1977, pp. 102-103)

As an example of the thought processes that Flavell describes, consider this field report from Wolcott, dated March 4, 1980:

> But what happens when the teacher is not sure what the lesson is "supposed to be" or feels relatively little commitment to the lesson as perceived? I recently observed a lesson in which I think either the lesson was not clear to the teacher or it was unconvincing. While the teacher and class dutifully held a follow-up discussion (due in part, I think, to the teacher's feeling that that was what I wanted to see), the lesson drifted from emphasizing how fortune tellers build ("expand") upon the information they already have into a game of almost blind "guesses" about both past and future.
>
> I was the "guinea pig." The course the teacher tried to set was in using information at hand to make inferences about (my) past or future. In proceeding through five predictions without benefit of feedback or analysis, the discussion drifted from a too-cautious expansion of too obvious facts (since I wear glasses I must be nearsighted or farsighted; that I'll die some day) to plausible conjecture (that I "could" be married) to sheer guessing (that I might once have had a paper route; that I might have been in the Navy). In the excitement, guessing eventually took precedence over what the kids already knew for fact (e.g., because I had taken pictures in class one day during their TV viewing, they "predicted" I would become a photographer when, as one boy later reminded them, they already know that I am a professor at the university).

Flavell believes that middle-childhood concrete-operational attainments are slowly consolidated and solidified during adolescence and early adulthood. These attainments "are progressively integrated into more and larger networks or structures of knowledge, thereby becoming related to an ever greater number of other concepts, beliefs, skills, et.." (Flavell, 1977, p. 110) Only then, according to Flavell—when one becomes a formal-operational thinker—can one employ systematic reasoning strategies in a hypothetical-deductive way.

Student responses to questions about the series in the case studies were generally given in terms of particular examples. Students were seen to need direct teacher assistance to see beyond the story line. Students at this age level cannot be expected to verbalize difficult abstract concepts in a meaningful way, and it appears that research will show little change. In fact, research on child development has shown that abstract reasoning ability is difficult to develop, even with relevant instruction, by the age of 11 or 12. One year with about one hour per week of instruction can contribute to the educational process, but the process is a long one and is affected by developmental factors that are still not well understood. From a cognitive psychology perspective, Simon (1975) noted:

> For most task environments [referring to problem-solving tasks], the classical problem of "What is learned?" is still largely unsolved. We do not know what a subject has stored in long-term memory when he has learned to perform a task, or in exactly what form he has stored it. Yet the precise nature of what is learned may have a considerable influence on both retention over time and ability to transfer skills to new tasks. (Simon, 1975, p. 268)

Klahr (1978) raised the question of why problem-solving skills are rarely taught directly to young children when rudimentary problem-solving skills are assumed in the early curricula, and advanced and general problem-solving skills are an explicit goal of subsequent instruction. Important cognitive changes take time and concentration. ThinkAbout may be seen as a beginning, but it is only one part of the educational process.

The ThinkAbout design is consistent with Dewey's (1933) conception of reflective thinking, in which thinking originates with a state of doubt, hesitation, perplexity, or mental difficulty and then moves into an act of searching, hunting, and inquiring to find material that will resolve the doubt, settle and dispose of the perplexity. Examination and test are unique features of reflective thinking. In Dewey's terms, given a difficulty, the next step is the suggestion of some way out, the formation of a tentative plan or project, the entertaining of some theory that will account for the peculiarities in the questions, and the consideration of some solution for the problem. Jumping to conclusions without searching is not reflective thinking. The reflective thinker must be critical, painstaking, open to examination and test. The question remains whether 10- to 12-year-old children (and their teachers) are ready to integrate these principles into their repertoire of behaviors, considering the paucity of direct instruction on reflective thinking throughout their educational careers (Klahr, 1978). Both Hart-Landsberg and Wolcott commented that they never saw a child "perplexed" or straining to get to the bottom of a real difficulty. All three case study researchers, however, noted how difficult it was to "get inside the heads" of children who were in classrooms where ThinkAbout was used. All were uneasy with their ability to discover ThinkAbout's cognitive impact on students.

Nevertheless, ThinkAbout effects on students were detected in the case studies and were reported by teachers in the surveys. The effect of the television programs on students' attending behaviors was powerful and lasted throughout the year. As Palmer (1972) noted, attention holding is one of the main indicators used to judge television effectiveness. For an age group that is characteristically lively and restless, fifth and sixth grade students were observed to be attentive for each entire 15-minute segment.

For example, Cohn reported on the classroom of Mr. Cartwright as follows:

> Of all the varied media selections that Mr. Cartwright used, ThinkAbout was clearly the most engrossing. While some of his other choices appealed to one group or another, all of the students, even those who were generally difficult to control, watched ThinkAbout intently. (Cohn, p. 116)

Students even watched ThinkAbout outside school. For example, Hart-Landsberg noted:

> Several children mentioned that they watched the show at home when they were sick. One boy asked eagerly whether it would be shown during vacation. (Hart-Landsberg, p. 22)

Teachers perceived that the series was educationally sound and was having at least a moderate impact on students for each of the skills being taught. Teachers perceived student improvement, as a result of using ThinkAbout, in each of the thinking skills areas covered by the series. In the last of the four surveys (May 1980), about 50% of the 460 teachers responding indicated high or very high success in strengthening students' ability in the ThinkAbout goal areas of problem solving, independent learning, effective expression, managing their own learning, systematic reasoning, and thinking flexibly. About another 40% indicated neither high nor low success in each of these areas. Ninety-three percent also agreed or strongly agreed that ThinkAbout had high overall educational effectiveness. At the same time, teachers in the testing study who were using ThinkAbout were asked to indicate on a five-point scale the degree to which their students had learned each of 32 skills from ThinkAbout. Almost all responses were located in the middle of the scale, indicating moderate impact on every skill. The case studies supported this conclusion. In the words of Ms. Church:

> The programs have been consistently good . . . they have a lot of skills that are very basic, they deal with thinking, problem solving and communications, and these are skills that the children are going to need in everyday life. (Cohn, p. 74)
>
> I think they are developing their reasoning powers and the ability to speak and reason things out and just general thinking skills because they seem to be able to speak out more clearly. . . . I can't pinpoint it exactly, but I just get the feeling they've grown and they can look at an issue more than one way. . . . They communicate and find the pitfalls of one another's reasoning and come up with this and that, then they bring it all together. (Cohn, pp. 74-75)

An important question that was not addressed in this research was "What were teachers seeing that led them to believe that students were learning new skills and concepts?" We need to pursue the observations of teachers and construct instrumentation that will highlight and document the student effects that teachers reported, much as Brickell (1976) did in his studies of the impact of vocational education in Ohio. We also need to develop process and outcome performance measures that document the development of project-related team work skills that ThinkAbout demonstrated in many programs. The work of the Clearinghouse on Applied Performance Testing

(CAPT) at the Northwest Regional Educational Laboratory might provide important information about how to capture these skills. If pertinent project assignments have been made in classrooms where ThinkAbout was used extensively, observations of task processes and work products would have the potential for showing student effects that were not documented in this research. However, the present data have provided insights into what to measure and how to measure that were not evident before.

The Design and Production of Instructional Television

For most fifth and sixth grade students and their teachers, television is an entertainment medium. Although it is used in thousands of classrooms for instructional purposes (Corporation for Public Broadcasting, 1979) it is used almost universally in homes for entertainment. Students attend to television if it is attractive to them; their interest wanes if the action slows. Much has been written on the importance of using television to attract and keep student attention (Schramm, 1972; Chu and Schramm, 1979), and this study adds yet more support for the idea. As most instructional designers will attest, getting the attention of students is a necessary initial step toward teaching them anything. The program design and the production quality of ThinkAbout were strong, and the series was well-received by teachers and students in classrooms where it was used. It gained and held the attention of both.

One important value of program appeal was identified when teachers reported that they considered student interest and feedback in deciding to use or continue using the series. Teachers take their cues from students, and instructional television use is affected by the teachers' perception of how well it gets and holds the attention of the class.

There are trade-offs between the entertainment value and the instructional value of television (Schramm, 1972). An example identified in one case study contrasted the perceptions of students with those of teachers about whether television was play or work:

> During the early viewing period, immediately after their teacher switched off the television, the class sometimes became very active. Under these circumstances, Marie established order rapidly. Once she accomplished this with a lecture on the nature of *ThinkAbout* sessions, saying, "This is not a free period. It might seem like one because there are no books or anything, but this is a class just like any other." This was not the only time she carefully explained that *ThinkAbout* sessions were serious activity. (Hart-Landsberg, pp. 24-25)

Good teachers are well aware of the importance of sustained drill, transfer exercises, feedback to students, the structure and organization of content, and sufficient time for teaching skills. These principles of effective teaching, however, can limit or be limited by the way instructional television is used. Television allows for only one-way communication (although interactive, computer-assisted video instruction is an exception). When an instructional television series is designed for one-way communication, the designer of the series gives up some control of the instructional process. The needs of individual students cannot be known, nor can accommodation be made for them. Feedback to students cannot be provided by television alone. Drill, repetition, and highly structured lessons are the antithesis of good entertainment. Thus, instructional designers and producers of instructional television are faced with decisions that have to be compromises between the best instructional and the best entertainment techniques.

The design of instructional television must consider the teacher as an instructional partner, and the level of dependence on the teacher for the instructional value of a series can account in part for the variability of impact found in studies of instructional television. Good teachers will use programs in idiosyncratic ways, and when variations in use occur, variations in the nature and level of impact will be seen concurrently. ThinkAbout was designed so that the teacher is an important partner in instruction. It was also designed for flexible use by the teacher—as individual programs, as clusters, or as a series. It should not be surprising, then, that considerable variability in the use and impact of the series was found in this study, since such variability was by design.

Alternatives to the design of ThinkAbout might have resulted in differences in use and impact. They might also have differentially affected the entertainment value of the series and its appeal to students and teachers. Design alternatives that would have limited the role of the teacher are:

1. To provide organizers at the beginning of each program to remind students (and teachers) where they have been, where they are going, and how the program fits into the whole.

2. To provide assignments, activities, or exercises as part of each program whereby skills developed in the program may be practiced. Later programs or stop-action-response formats could be used to provide feedback to students on their responses.

3. To repeat instruction on a particular skill a sufficient number of times to increase the probability that students have learned it and can (and will) apply it.

4. To mass the instructional schedule so that it becomes a significant part of school life and the number of competing lessons is reduced. This could be accomplished by providing two or three 15-minute programs daily, for example.

5. To test students on their comprehension and ability to apply the skills and concepts being taught. Making students accountable would increase their role in instruction.

Design alternatives that would have increased the role of the teacher are:

1. To design a 30-to-45-minute block of instructional time in which the program itself constitutes 15 minutes. The remainder is teacher time on the skills or concepts being developed.
2. To provide a TV Guide-style synopsis for each program in the series so that teachers can easily select the programs of their choice.
3. To provide videotape libraries to schools so that teachers may select and use programs, clusters, or the series at will, rather than depend on broadcast schedules.
4. To provide readings on the concepts or skills being taught by the series so that teachers may develop their own curriculum to supplement the one provided to them.

The ThinkAbout design is one that provides for a large role for the teacher. The case studies and surveys indicate that some teachers could use more structure (see, for example, Ms. Church's comments in Cohn) and would resist playing a larger role in instruction with the series. (In contrast, see Cohn's study of Mr. Cartwright and also Wolcott's report.) Some teachers were tired by the time the programs were broadcast and welcomed the relief they provided (both Hart-Landsberg and Wolcott describe this phenomenon). Some unimaginative teaching was reported in the case studies, and in some cases (e.g., Ms. Church) preparation for instruction was limited or nonexistent. Many teachers asked for more support materials, such as posters, duplicate masters, and learning games. There was some indication that the suggested student activities in the teacher's guide should be specific and short-term.

Whether teachers need more or less structure and an increased or reduced role in instruction with television is an issue that is complex, but pertinent to the design of a series. The case study reports and survey data provide a partial picture of the diversity in the use of ThinkAbout in classrooms. Any more structure may discourage teachers from using the series. Any less structure may be intolerable to a good many. This study served to illuminate, if not to resolve, the issue.

Joyce noted:

> In examining the literature related to media and education, it is clear that teachers are interested in using media, and that the equipment is available. Unfortunately, the literature is incredibly weak with respect to the behavior of the teacher when dealing with media. (Joyce, 1975, p. 103)

Answers to Research Questions

Two sets of research questions were listed in the first section of this report. They guided the design, analysis, and reporting of the studies. We now return to those questions and provide answers based on the completed research.

Question 1: Introduction and Use of ThinkAbout

Q: How is ThinkAbout used during its first year of availability?

A: There is no simple answer to this question. ThinkAbout was used in many different ways, depending on such factors as the teacher, the school administration, the prominence of ThinkAbout in the total curriculum, outside interruptions, and the use of the teacher's guide and other supporting materials. The discussion above highlights several different ways in which ThinkAbout was used. Further details are provided in the case studies, and teacher reports of how they used ThinkAbout may be found in the survey reports and the testing study end-of-year teacher report.

Q: How was the decision to adopt the ThinkAbout curriculum made?

A: Primarily by the teachers. They heard about the series from promotional material mailed to them (90%), in workshops (24%), and from individuals in their school districts. As they began to use ThinkAbout in their classrooms—and even before they used it—they tended to check their students' reactions to the programs before making a commitment. A profile of teachers who decided to use ThinkAbout during its first year of availability, taken from the four surveys, revealed the following characteristics:

- Most of the teachers had used school television in 1978-79 and were also using other school television series concurrently with ThinkAbout in 1979-80.
- Most teachers were from small towns and suburban school districts.
- Most teachers were in self-contained classrooms.
- Almost all teachers had received promotional material on the series, some had attended orientation meetings on ThinkAbout, but few had received training in its use.
- Almost 1/4 of the teachers viewed the programs on videotape rather than from broadcast during the first year.
- The average teacher spent about two hours per week viewing, discussing, and working on assignments related to ThinkAbout.

—In the beginning, more than half the teachers used ThinkAbout as an independent study and reasoning skills curriculum, while the rest attempted to integrate it with existing curriculum areas. By the latter part of the year, most teachers had integrated it to some degree.

Q: What can be learned about how television is used in the classroom to aid in the design, production, and utilization of future series?

A: The following findings may affect the way producers and designers develop a series in the future:

1. The initial impressions of teachers and their students, especially on the entertainment value of the series, are critical in getting a long-term commitment to use the series. Teacher beliefs and attitudes toward instructional television beforehand also affect their decision to use a series.

2. Short, regular, structured time segments that can be encapsulated and inserted into the school day are likely to be attractive to some teachers.

3. A series will be most attractive if it can accommodate both low and high teacher involvement in instruction (i.e., preparation, leading discussions, giving assignments, grading, integrating lessons from the series with other instruction during the day).

4. People's expectations for the potential impact of a series must be moderated by knowledge of the diverse ways in which the series is used, of high variance in teacher capability and level of commitment, of the prominence given to any new

instructional materials in the total curriculum, and of the developmental stages of children for whom the series is intended.

5. Teachers tend to desire supplemental support materials, but few seem to find much beyond the teacher's guide to be essential. The May 1980 survey revealed that 90% of the 460 teachers responding were using the teacher's guide. The addition most desired was duplicating masters or worksheets.

6. Teacher orientation and understanding of the conceptual design of the series will influence the way in which it is used in the classroom.

7. Reminders to students and teachers of the overall goals of the series throughout its presentation will help them to integrate newly learned skills and concepts.

8. Fifth and sixth grade students like to talk during the post-viewing discussions and relate their personal experiences to the lesson, but they tend not to listen to each other.

9. Assignments and grading for the new instructional materials not only force practice and application but also legitimatize the new curriculum as schoolwork.

10. Videotape libraries and readings on the skills and concepts taught will allow teachers who have missed lessons because of interferences to catch up and sustain the use of the new curriculum.

11. Support for the new curriculum for use by other school personnel, including building principals, will enhance the sustained use of the series.

Q: Are there barriers to and facilitators of the effective use of instructional television in schools?

A: Yes. Barriers include interference with the use of instructional television due to scheduling problems such as holidays, early dismissal days, parties or special events, and field trips; broadcast errors, such as repeats and programs broadcast out of sequence; teachers forgetting about viewing a program; the presence of substitute or student teachers; and competing priorities such as textbook-based basic skill instruction or pressures from the curriculum specialist or principal for other content. Coupling these with the teachers' capability to prepare and lead relevant and effective lessons and the perceived legitimacy of this part of the total curriculum, one can expect substantial individual classroom differences in the effectiveness of school television.

Facilitators of the effective use of instructional television include a well-structured and easy-to-use teacher's guide, support materials, and a teacher orientation that focusses on the ideas behind the series. Effective orientation and follow-up workshops can be affected by dissemination plans. The scheduling of broadcasts (afternoon rather than morning, for a break), the entertainment value of the series, and its production quality will also enhance use.

Question 2: Impact of ThinkAbout

Q: What are the perceived and measurable effects of the series?

A: Teachers' perceptions of the impact of the series on their students indicated at least a moderate educational gain in each of the goal areas in the *ThinkAbout* design. Teachers believed that the series had educational value. Most teachers who used the series during its first year of availability planned to use it again and recommended it to other teachers.

Tests used in the study yielded limited evidence on goal attainment by students in *ThinkAbout* classrooms. The CTBS tests detected no unusual patterns of basic skill acceleration. The *ThinkAbout* instruments provided spotty documentation of the development of thinking, self-management, and communication skills. Nevertheless, it is worth noting that the introduction of two hours per week of problem-solving and study skills instruction did not diminish basic skills learning and added a new element to the classroom.

The series attracted teachers and students for sustained use during the school year. Given content judged educationally sound and given the sustained attending behaviors of teachers and students, *ThinkAbout* resulted in a noticeable change in curriculum. Topics not ordinarily covered in a systematic way were introduced in a large number of classrooms. The end-of-year questionnaire data from classroom teachers in the testing study who were using *ThinkAbout* revealed that 85 out of 94 respondents agreed or strongly agreed that *ThinkAbout* extends the range of experiences available to students, and 72 out of 93 respondents agreed or strongly agreed that *ThinkAbout* presents content not commonly available in existing curricular material. In one of the surveys, 84% of the 489 teachers responding indicated that they agreed or strongly agreed that

ThinkAbout presented complex ideas better in 15 minutes than the teacher could, and 88% agreed or strongly agreed that ThinkAbout aroused discussion in class.

Q: How much student change can be noted toward the basic goals of the series?

A: The tests and exercises used in the study were generally not sensitive to student change. Statistically significant changes were found on certain exercises in the ThinkAbout tests. Teacher responses to survey questions give reason to believe that student changes did occur that were not measured by the tests and exercises. There is a good chance that applied project-type assignments will indicate student change in both the processes and the products they create to address complex problems.

Q: Is there a relationship between use patterns and impact?

A: There is good reason to believe that there is a relationship, but the sketchy data on impact does not allow the drawing of firm conclusions, especially since the study was conducted under natural classroom use conditions. There was little variability in reported patterns of use by teachers in the testing study (most teachers used most of the programs), and there was little variability in test performance by classrooms in the testing study. The computing of correlations between use and test performance was hence restricted by the natural conditions under which ThinkAbout was studied. Studies of ThinkAbout under tightly controlled conditions are needed to address this question adequately.

Q: Do certain kinds of teachers and students find the series more (or less) useful than others?

A: The study revealed no teacher or student characteristic that could be used a priori to identify teachers or students that would find the series more (or less) useful than others. It seems to work equally well among disparate kinds of teachers and settings. However, teachers who are predisposed to the use of instructional television are the group in which the sustained use of a series is most likely to be found.

Implications

The practical use of the information and interpretations provided in earlier sections of this report is highly important. In this section we first consider ways in which the use and impact of ThinkAbout might be enhanced. We then present some thoughts about planning for future instructional television projects, using the ThinkAbout experience as a foundation. We conclude with a discussion of what a continuing agenda for research on instructional television might look like. This section again reflects the authors' personal judgments and is open to reinterpretation by readers who approach the subject from a different perspective.

Enhancing the Use and Impact of ThinkAbout

There are at least two areas in which ThinkAbout use and impact might be affected. These areas are 1) dissemination and 2) training in instructional methods. Using the Levels of Use (LoU) framework developed by Hall et al. (1975), our best estimate is that teachers using ThinkAbout can be characterized as operating at level III, mechanical use of the innovation, a point at which they are just beginning to use the materials. Hall et al., in their analysis of the adoption and use of various kinds of educational innovations, have described this level thus:

> [the] state in which the user focuses most effort on the short-term, day-to-day use of the innovation with little time for reflection. Changes in use are made more to meet user needs than client needs. The user is primarily engaged in a stepwise attempt to master the tasks required to use the innovation, often resulting in disjointed and superficial use. . . . [The teacher] manages innovation with varying degrees of efficiency. Often lacks anticipation of immediate consequences . . . when changes are made they are primarily in response to logistical and organizational problems. (Hall et al., 1975, pp. 55-56)

The question that remains is how we get teachers beyond a mechanical use of the series. The Levels of Use framework suggests that routine use will follow, in which the use of the series will be stabilized, and then refinement, in which teachers will modify the use of the series to increase its effects on students. It may eventually turn out that many teachers can go beyond these uses of ThinkAbout to the highest levels described by Hall et al.

One long-term strategy for enhancing the level of use is to give teachers one year of experience in using the series, expecting that the second time through, teachers can think more about their instructional goals and how to achieve them with ThinkAbout than worry about whether they did what AIT thought they should do with the series.

Another strategy that might short-circuit the year of experience is a series of in-service workshops, given perhaps over a week at the beginning of the school year for teachers considering the use of ThinkAbout. These workshops would concentrate on the substance of the series—the theory and design underlying it, its content (what each program is intended to accomplish), and teaching "tricks" that would help to bring about desired changes. A network of ThinkAbout teachers might be established within a state or region so that teaching ideas, experiences, and new refinements might be shared. A support group for ThinkAbout use might be established this way.

Promotion of the series is important, but we know that many teachers rely on word-of-mouth dissemination to learn about innovations and to decide whether to use them. Concentrated efforts at establishing local support and training could enhance the use of ThinkAbout substantially. Dissemination could proceed through stages of awareness, followed by training in theory, design, and content. Awareness workshops might be widespread, while the substantive workshops might be only for teachers who have decided to use the series.

A similar strategy could prove effective in enhancing the impact of ThinkAbout. We are relatively certain that ThinkAbout can only be as effective as the teaching that goes with it. In its first year of use, we found a great disparity in instructional procedure and skill demonstrated by classroom teachers. If this is interpreted as a need for in-service training in teaching skills, workshops for ThinkAbout teachers might be systematically designed within a state or region to:

1. Assist teachers to develop student outcome objectives in the areas covered by ThinkAbout (problem-solving skills, effective communication, self-management, confident and flexible thinking).

2. Design instructional activities, including the use of ThinkAbout, to achieve their student objectives.
3. Develop good questioning and discussion skills related to the student objectives, since these skills are critical in using ThinkAbout.
4. Prepare exercises and assignments that will provide application experiences associated with the student objectives.
5. Develop grading methods to determine how well objectives are being achieved and to lead to remediation steps (troubleshooting) if performances are found deficient.
6. Develop valid tests of the achievement of student objectives.
7. Develop and share teaching "tricks" for each type of student objective.

The critical ingredient in these workshops may be teacher involvement in conceptualizing and personalizing their own curriculum on reflective thinking—one that they can understand and use. By emphasizing assignments, practice, feedback to students, and grading, the new curriculum will be given a legitimacy that it seemed to lack in its first year of use.

Planning for Future Instructional Television Projects

We have seen that the actual curriculum that appears in a classroom is dependent on the individual perspective, background, skill, and intention of the classroom teacher. This finding is not a new one; it has been reported several times in the literature.

A good number of teachers will receive a new series at the mechanical level of use and will want to be told what and how to teach. Having specific supplemental materials on which they can draw seems to be important, at least in the initial stage of adoption.

A new series should fit into the "routine" of daily schedules, should be easily accessible, and should be flexible enough to accommodate interventions such as holidays, special programs, and other high-priority events. Having videotape libraries, readings, and support materials available could assist teachers who are using a series at a mechanical level and who may require some flexibility of use.

A new series should fit with the priority subjects being taught in the schools. There is considerable pressure on classroom teachers to stick to the textbook and teach for tests. Unless teachers and students are held accountable for achievement based on content covered in a television series, the series is likely to receive low priority. If it does not add to what teachers perceive themselves as doing well already, it is also likely to be neglected.

The need for any new series should be carefully assessed in the field if large resources are to be committed to it. With resource cutbacks, needs in education are becoming greater; some of them might be met by enhancing test performance and literacy, by replacing laid-off teacher aides, and by replacing curriculum areas that have been discontinued because of personnel cutbacks. The compulsory use of school time in ways that show accountability is a reality for the classroom teacher.

A Continuing Agenda for Research on Instructional Televison

We have identified a number of research avenues to pursue. These include:

1. Working with teachers to measure and document the student changes they reported as a result of using ThinkAbout.

2. Studying the use and impact of ThinkAbout in classrooms where the teacher was using it for the second straight year. Follow-up studies and longitudinal studies could reveal very different findings.
3. Studying individual differences across students in the development of thinking skills and in the ability to learn from television.
4. Studying different methods of teaching, including discussion styles, with television and designing television to fit specific teaching contexts.
5. Studying different methods of using television in teaching for transfer to new situations outside school.
6. Studying where instructional television is placed in the value systems of classroom teachers and what criteria teachers consider in making decisions about television use.
7. Further studying what ideas, people, publications, and educational content and practices encourage teachers to use instructional television.
8. Further studying the types of users and the forms of use of instructional television.

In summary, it is worth paraphrasing a conclusion from Weiss (1972): one cannot draw unequivocal conclusions about the effects of a series like ThinkAbout on the basis of one study alone. Its findings will show ambiguous outcomes influenced by the specific events of the place and the moment.

While this project was broad in scope and comprised three very different approaches to studying the introduction, use, and impact of ThinkAbout, many uncertainties remain. Only continued efforts at clarifying what we know and putting new ideas to the test will lead to the certainty that many would wish for. Much has been gained from this study, but much remains to be learned.

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